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UNITED STATES DEPARTMENT OF AGRICULTURE
Radio Service
OFFICE OF INFORMATION

WITH UNCLE SAM'S NATURALISTS. RELEASE Friday, January 1, 1932

FOR BROADCAST PURPOSES ONLY

ANNOUNCEMENT: We now have our visit with Uncle Sam's Naturalists of the United States Department of Agriculture. --- Well, Mr. Wilds Man, let's start the year right and hear the news from Nature -----

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Happy New Year, everybody!

When we get out in the wilds, we sometimes like to forget the calendar.

But on New Year's it is the "quaint old custom" to sort of look around and get our bearings, and note the landmarks, as it were, to make sure where we are, and how far we have come.

Of course, we think of the birds and animals of the wild as paying little attention to our calendar dates, except possibly those we announce with guns at the beginning of hunting seasons. Taken by and large, their habits probably haven't changed much since the memory of man runneth not to the contrary.

Yet I gather from what Paul G. Redington, chief of the Bureau of Biological Survey, says in his annual report, that wild life may have the same old ways, but we are finding out new things about those ways right along. And there is a lot we don't know yet. That's true as to the habits of individual birds and animals, and also in regard to the way one form of life affects another. The Bureau of Biological Survey has quite a job. In some cases it is a matter of protecting wild life against extermination by human beings, in others it is a matter of protecting one kind of wild life against another, or even protecting man or his possessions against wild animals.

Nor is that as simple as it may sound. There is such a thing as too much protection of one species at the expense of some other. During the past year, Mr. Redington says, specialists of his Bureau found new or added evidence that on some of the more important deer, and antelope, and elk ranges in southeastern Arizona, and the Kaibab deer ranges in northern Arizona the animals have increased so much under protection that they are doing serious damage to the forage already, They threaten to destroy the forest cover and the food-producing capacity of those ranges.

In order to protect adequately the better species of shrubs and young trees and other plants on which the animals feed, the number of deer will have

to be reduced in some localities. Otherwise, they will overgraze, and kill off the forage plants, so the range will not support as many animals as it can now support without damage.

One way the investigators propose to reduce the number of deer is to let other forms of natural wild-life flourish. That is, those areas would be closed to private trapping and hunting of the big flesh-eating animals. Protected from hunters, those animals would help to take care of the extra deer.

That idea of leaving the wilds to its own wild ways of taking care of such problems appeals to some folks as the proper way to handle wild life. Just let them alone and let them fight it out among themselves.

But it is not always safe to do that. Because often the predatory animals, such as mountain lions, and wolves, and coyotes, and bobcats get so numerous they threaten to wipe out some of our more valuable animals. According to the Forest Service, more game animals were killed on our national forests by predatory animals than by hunters year before last. The reports indicate that more than 88,000 deer, and elk, and moose, and mountain sheep, and antelope, and mountain goats were killed on national forests by predatory animals, while hunters killed fewer than 60,000 there.

Where there is a surplus of game animals, such predators as mountain lions may do very little damage to domestic stock. But where game animals are scarce, they become a serious menace. The expert hunters and trappers of the Biological Survey are often called on to help protect stockmen against such beasts of prey. During the past year, officials in Argentina were inquiring about our ways of controlling mountain lions. It is reported that mountain lions in that country are destroying large numbers of cattle and horses. But plenty of stockmen and other informed people in this country will tell you that you don't have to go that far away from home to find cattle killed by lions, and wolves, and coyotes.

Coyotes, Mr. Redington says, continue to present our most serious problems in predatory animal control. Many people think of the coyote as being confined to the West; but they don't know the coyote. Those little wild dogs with the cold, calculating eyes are not only found in all the western part of this country, but are becoming scattered in the East. Last year, a coyote was killed near Jamieson, Florida, and another in the suburbs of Baltimore, Maryland. In fact, coyotes are found from Mexico to Alaska, and they seemed to have adapted themselves well to living in close touch with man.

By extending ranching and agriculture into what was formerly the "wilds," we have provided banquets for some of the wild creatures. In consequence of the "easy-pickings" we have provided, some of these animals have in places increased more than they could have in the keen-competition of their native wilds.

The same is true of some of our troublesome birds. Damage by birds has always been most pronounced where agriculture is being extended into new areas. The orchard planted in a clearing among the foothills, or the rice field made in a marsh where nature formerly held entire sway is immediately recognized as a first-rate source of food by the birds and other forms of wild life.

That accounts for the serious situation with regard to destructive birds on the Pacific Coast. In California, the linnet or house finch does more than a million dollars worth of damage a year by eating buds and fruit! And that is just one kind of bird. Horned larks do almost as much damage by destroying seedlings of vegetable crops as linnets do to fruit. Sparrows add to the destruction. Blackbirds and coots do heavy damage to the California rice crop. In fact the bird situation is so serious in that State, that last year the Biological Survey put two investigators to work studying conditions and finding ways to control the damage.

You see, in this matter of either protecting wild life or of keeping it in control, we need to know the "personal" habits of the birds and animals. With birds here to-day and gone to-morrow, it is highly important to know their behavior and just what conditions they find at other stop-overs along their route, and especially the condition where they nest.

Last year, bird-banding cooperators of the Biological Survey banded more than 169,000 birds. Since this work was started about eleven years ago, they have banded nearly a million birds and many thousands of reports have been received. Many of the bands have been reported or returned by hunters who found them on legs of ducks or other birds they have brought down. Each band is numbered, and knowing where it was put on, and where the bird was brought down, it gives a clue to that bird's flying route. In this way, the Biological Survey is gradually finding out more and more about the courses followed by different migratory birds in going to and from their nesting and feeding grounds.

Of course, in determining the extent of protection or of control needed, the food habits of the birds at different seasons and in different places along the route must be known.

In fact, there are a number of fascinating investigations in progress which may reveal to us new facts about our old acquaintances of the wilds. From time to time, during the coming year, we hope to tell you about some of them.

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ANNOUNCEMENT: You have just listened to a program presented by the United States Department of Agriculture and Station _____. This time two weeks from today we will have another visit with Uncle Sam's Naturalists.

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UNITED STATES DEPARTMENT OF AGRICULTURE
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WITH UNCLE SAM'S NATURALISTS. RELEASE Friday, January 15, 1932

FOR BROADCAST USE ONLY

ANNOUNCEMENT: And now let's go back in the wilds for another of those visits with Uncle Sam's Naturalists of the United States Department of Agriculture. Today it is with foresters on our western mountain range lands.------Well, Mr. Wildsman, what is happening out there at the "Home on the Range"?----------

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Well, it seems from what the U.S. Forest Service men tell me, that range lands in the western part of this country have changed. Many of them have changed considerably, too.

Of course, you know there are changes going on in Nature all the time. That is the law of life in the wild, as well as in the tame. But those more or less slow, steady changes we think of as normal is not what I am talking about.

Out on some of our western mountain range lands in recent years big changes have been taking place and taking place fast. Maybe you wouldn't notice the difference, but these plant experts, who know life on the range down to the very grass roots, find the ground cover has undergone tremendously important changes. Yes, sir, the very character of the ground cover has changed over wide stretches of range. In many cases, poison weeds and worthless plants have replaced shrubs and grasses which used to be the feed of the cattle on a thousand hills. In other places, the plant cover has been so thinned out that serious erosion and washing away of the soil has set in.

You probably guess what is behind those changes. And you are right. Fire and overgrazing are chiefly responsible. When you put more cattle or sheep on the range than the range can support readily, pretty soon it can't support even as many as it did.

The cattle and sheep go after the tastier, better forage plants first. Then the range is too heavily stocked, the better plants which may predominate are kept down to such an extent that their less valuable competitors have a better chance to take possession of the range. Those poorer species supply less feed and support fewer head of stock.

On the higher and drier ranges, land sometimes gets too little rain to support a complete ground cover at best. With overgrazing and fires that land is soon exposed to erosion and washing. And, the range specialists say that if that erosion is not stopped, it will reduce the land to a barren waste.

How can you stop it? -- Well, naturally, the first thing you think of is to stop grazing on such land. But in many cases, grazing helps keep down the danger of fire. For instance, sheep grazing on cut-over Douglas fir lands, not only eat the foliage of many of the plants, but they trample down much of the uneaten vegetation. They break up a considerable part of the dry material left on the ground. They work it partly into the ground where it can not burn so readily, and where it is more likely to absorb moisture. To a certain extent, therefore the grazing helps to keep down fire damage.

It is no simple matter to determine just how far grazing should go for the good of the range. However, foresters agree that on some types of land moderate grazing doesn't seriously interfere with the tree growth and what little injury may be done is more than made up for by the lessening of the danger from fire.

They do say that precautions must be taken in any event to see that the range is not overstocked and overgrazed. Grazing must be regulated.

But on many of the ranges, which have already been seriously damaged by fires and overgrazing, just limiting the number of stock permitted on the range will not be enough to get the range back to its old time capacity to supply good forage.

Abnormal grazing and repeated fires, you might say, have artificially interfered with the plant life on the range and changed its character. For that reason, foresters have been looking into the possibilities of artificially re-seeding range lands. That has already been done successfully on limited areas where growing conditions are above the average.

Of course, when you come to planting vast stretches of range land there are a lot of practical problems to be met. Taken by and large, the foresters say it seems reasonable to suppose that native, wild grasses are naturally better suited to growing conditions where they are found. But just what wild grasses seem promising? That is one of the things investigators are now trying to find out. Then, too, there is the question of whether enough seed of such grasses can be had at low enough cost to making sowing the range to them really practical.

It may be, the plant experts say, that we can actually discover or develop plants that are adapted to the less favorable conditions than those found on the mountain meadows, and moist parks, and bottom land along streams where re-seeding is now considered feasible. In fact, they even hold hope for better forage plants than we now know.

So far, most of the work of reseeding range lands has been with cultivated or tame forage plants. And even those have not yet been tested out as fully, or under as many conditions, as seems to be warranted.

But much more has been done with those tame grasses than with our wild native grasses. Nor do the wild and tame grasses now growing in this country include all the possibilities. It may be that in other parts of the world, better forage plants than any we now have may be growing on ranges under similar conditions to those we have in our West.

The range men say there is a real need for exploration of the likely range lands in other parts of the earth for better forage plants for our own ranges. And there seems to be nothing improbable in the idea when you recall that

that nearly all the forage plants now grown in extensive cultivation in the more humid parts of our country were brought here from abroad. They are not native. Why, the plant experts even tell me that our famous Kentucky blue-grass, not only isn't blue, but didn't really come from Kentucky to begin with. It was introduced from the Old World. And by the way that Kentucky blue grass is one of the grasses which have given good results on the moister western mountain grazing lands.

Timothy, however, has given best all around results when tried out on western range sites where the soil is moist. Quack grass classed as a troublesome weed on farm lands in the East, seems to have possibilities for usefulness as forage on range lands in some parts of the West.

When we speak of western range lands, however, we are taking in a lot of territory, and a lot of different conditions, moist and dry, hot and cool, long and short growing seasons. From what I gather from these range investigators, wild native grasses, tame grasses from the East, yet untested plants from remote sections of the globe may all be used to help bring back the carrying-capacity of our western ranges.

It is a big problem, but a mighty important problem for the future of our livestock industry -- or that big part of it with its home on the range.

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ANNOUNCEMENT: The program to which you have just listened came to you as a presentation of Station---------and the United States Department of Agriculture. We will have another visit with Uncle Sam's Naturalists two weeks from today.

UNITED STATES DEPARTMENT OF AGRICULTURE — Radio Service — OFFICE OF INFORMATION

WITH UNCLE SAM'S NATURALISTS — RELEASE Friday, January 29, 1932

FOR BROADCAST USE ONLY

ANNOUNCEMENT: And now our Wildsman is going to tell us a few things about that most interesting and unique animal, the beaver. It seems that Uncle Sam's Naturalists of the United States Department of Agriculture are experimenting with beavers --- but our Wildsman will tell you about those experiments -------

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Maybe you heard that Mr. Vernon Bailey recently planted a few beavers near the Pisgah National Forest, in North Carolina.

Mr. Bailey is a field naturalist of the U. S. Biological Survey and an authority on the habits of beavers, and many other wild animals. Only he might object to my calling them "wild animals" because he insists that many of them, and especially beavers, are very friendly when you come to know them personally, as it were.

Incidentally he says a lot has been written about beavers, but unfortunately much of it by men with little first hand acquaintance with these famous dam builders themselves. In that way, much misinformation has been spread around about them---but more about that later. ----

First, let me tell you about this little experimental colony of beavers, Mr. Bailey just helped plant in the North Carolina mountains.

Beavers used to live in those forests. In fact, they originally inhabited the greater part of North America, and at one time they produced fur of greater value than that of any other fur-bearing animal of the continent. Indians used them for food and warm clothing. You remember from your history, beaver skin was used as a unit of barter with the Indians. The fur soon attracted white traders and trappers, and the traffic in beaver skins became an important commercial factor in promoting the early settlement of the country. But that was "once on a time" as they say in the story books. Generations of intensive trapping completely exterminated beavers over much of their former range, many, many years ago.

For a number of years now, however, beavers have been given protection in many sections of the country. After long absence, they have been restored to some parts of their old range.

For example, it had been more than a hundred years since the last beaver had been trapped in Pennsylvania, when about ten years ago a dozen beavers were brought down from Canada to restock part of the old range in that State. Under

the protection of good laws well-enforced these beavers multiplied, until today there are 10,000 beavers in Pennsylvania, and most of the wild land is well stocked. So much so that trapping is to be resumed and 2,500 beavers will be permitted to be taken during a short season next month and many will be caught alive in traps and sold for breeding purposes. Mr. Bailey himself designed the original type of trap used in capturing beavers alive and uninjured.

Beavers have also long since been gone from our Southeastern States, where there were plenty in colonial days. Yet there is a lot of land not worth cultivating and not earning anything, which Mr. Bailey thinks might be made profitable with a light stock of about 100 beavers to a 1,000 acres. It is better to have them scattered out. You can't crowd beavers too much. In building their dams, they sometimes flood low ground and kill great areas of valuable trees. Sometimes they cut choice timber trees for food and building material. As a rule, however, in the northern states, beavers cut mostly aspens and cottonwood and other trees of little value for timber.

The trees most favored in the northern range are not those upon which the beavers will have to depend for food in the South. What trees they prefer in that region is not known. That is one of the things the foresters and naturalists want to find out by observation of this new experimental colony. How will the beavers thrive in an environment where they don't have to store wood for winter as they do in the North? Will beavers prove a profitable asset on land being reforested? These and many other questions will be answered by close observation of the new planting of beavers.

Mr. Bailey says that in all beaver colonies under control and observation as well as in many places in the wild, he has observed a great waste of food. The beavers often cut trees in close stands and when cut many lodge against others instead of falling to the ground where the beavers can cut them up and use them. Often half of the timber cut is wasted that way. The beavers try hard to get the trees down but often without success.

You know, in their cutting, and building, and transporting of timber, they show remarkable ability, but not the great engineering skill some nature fakers have attributed to them.

Mr. Bailey says patience, and persistence, and strength, and industry are more important factors in beaver work than quick wit or versatile mentality.

They seldom go far from water in their search for food and building material, because they are rather slow travelers on land, where they are easily tired and get out of breath quickly. They are built for life in the water rather than on land. In fact, their equipment for working under water is remarkable. Their ears are equipped with valves that close as they dive and open instantly as they come to the surface. Their nostrils are also small and valvular, and close under water. Most striking of all, however, is a beaver's mouth. It has hairy lips, which close back of its protruding chisel-like cutting teeth, so it can use its teeth in cutting or tearing up roots or sticks below the surface without getting water in its mouth. And the grinding teeth back of valvular lips can be used for chewing while the lips are closed in front to keep out the water.

Most of the digging a beaver does, and he does a plenty, is under water. Beavers usually deepen their ponds by taking mud and earth from the bottom to

use in plastering up the dam and house. Then they also make big burrows. They begin these at the bottom of the pond or stream, dig up into the bank, and end by widening out a sort of cave-like nest above the water level. Those bank burrows are sometimes 40 to 50 feet long and big enough for a man to crawl into. Then, of course, you know they dig those canals or waterways they use in floating timber and for swimming through lowlands for food. But beavers rarely dig on the surface of the ground and never make a burrow with an exposed entrance.

I might go on indefinitely telling you some of the interesting things about beavers which Mr. Vernon Bailey told me. Of course, you have seen their dams and houses and know how they are built, and have noticed how the trees are cut and stripped of their bark for food.

But I don't know any better way to end this talk than to say a word about the beaver's tail. There has been a lot of specualtion about why a beaver's tail is wide and flat. Mr. Bailey says one of the uses for that tail is to slap the water loudly as a sort of warning signal to friends and foes, but chiefly it is used in the water as a rudder and propeller. Its full width and steering power is taxed to the limit as the beaver swims, tug-like by the side of a pole or log it is towing to the house or dam.

ANNOUNCEMENT: You have just listened to a program presented by the United States Department of Agriculture and Station _____. This time two weeks from today we will have another of these visits with Uncle Sam's Naturalists.

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UNITED STATES DEPARTMENT OF AGRICULTURE

Radio Service

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UNCLE SAM AT YOUR SERVICE

February 8, 1932

NOT FOR PUBLICATION

SPEAKING TIME: 11 Minutes.

ANNOUNCEMENT: This is Station_____in_____and we bring you again the Veteran Inspector, who is going to tell you more about the work of Federal officials who enforce the pure food and drug law. The Inspector, a veteran in this work, is an official spokesman for the Food and Drug Administration of the Department of Agriculture and has been broadcasting these talks for two and a half years now. He has not yet exhausted his subject, however. Today he is going to tell you what is going on at one of the Food and Drug Administration's most important field inspection stations. Mr. Inspector---

--ooOoo--

Imagine a city with 127 miles of deep waterfront--- which has the fastest coal loading piers in the world--- the largest grain elevator on tide-water in the United States--- which ranks as the second American port in volume of import tonnage handled--- the first American port in volume of westbound intercoastal traffic handled--- and which is the seventh industrial city of the nation. . . .

Imagine a city whose industries vary all the way from copper smelting to the manufacture of bottle stoppers and straw hats. A city which has the largest fertilizer and alcohol output in the country. Think of a city whose manufactured goods run all the way from meats, vegetables, and fish, to pharmaceuticals, porcelainware and candy. . . .

Imagine a city characterized by Oliver Wendell Holmes as "the gastronomic center of America," which is famous for seafoods, fruits, and vegetables, and whose open-air markets rank among the largest and most fascinating in the country. In this city--- as I found in New Orleans--- most housewives do their own marketing. Dowagers in high-priced automobiles, as well as the humblest dwellers in the alleys, go to the market daily to select the fixings for the splendid meals for which this city, Baltimore, is famous.

I probably did not have to tell you that the city was Baltimore if you have traveled very much. And if you are familiar with this famous old town you would know that it is not only renowned for good eating, but also for having perhaps as diverse a list of businesses and industries as any metropolis in the nation. Its manufacturing industries employ more than 86,000 workers, and the people of Baltimore can choose for their daily menus locally produced foods, including oysters, terrapin, crabs, fish, game, and almost all varieties of truck garden products and fruits.

If you have been following my series of talks, which for the past few weeks have had to do with the work of the Food and Drug Administration's field inspection stations, you will know what I am about to say next. I am about to say next that it must be a hard job for the force stationed at the Baltimore station to keep in close touch with traffic in such wide varieties of foods, drugs, insecticides, etc., as go through the port of Baltimore every day. The torritory of the Baltimore Station is a large one, including Maryland, Virginia, West Virginia, the District of Columbia, and southern Pennsylvania.

If you will go down to 218 Water Street and take the elevator to the fourth floor, you will find the offices and laboratories of the men who are in charge of the enforcement of the Federal food and drugs act in the Baltimore station's territory. You will meet their chief, D. M. Walsh, who is one of the real veterans in food and drug control activities. Walsh is aided by eight chemists, two chemists' helpers, five inspectors, and four clerks. The station is one of the largest maintained by the Food and Drug Administration. Walsh was one of the first 13 inspectors appointed when enforcement of the food and drugs act was started in 1907. He is a Vermonter—— a graduate of the University of Vermont and of the George Washington University in Washington, D. C. The chief of the Baltimore station has been aided in his knowledge of enforcement work by experience at stations located in St. Paul, Spokane, Portland, Pittsburgh, Buffalo, Boston, and Baltimore. Two of his assistants, T. F. Pappe and E. H. Grant, were formerly in charge of branch laboratories in the food and drug inspection service. Another of Walsh's aids, John F. Earnshaw, one of the earliest inspectors appointed was in charge of the inspection of foodstuffs furnished the A.E.F. during the War.

Regulatory control of shipments of seafood, such as oysters, crabs, and fish, ranks among the most important projects of the Baltimore Station, Walsh tells me. And he told me something else—— when I was in to see him recently—— which I am sure all of you will be interested to hear. "We frequently find oysters adulterated with water," said Walsh. "This is, of course, illegal under the food law if the oysters are shipped interstate. While the shippers generally are putting up good packs these days, and complying with the law, there are still a few who deliberately "swell", or water, their oysters. This is partly due to a mistaken idea on the part of the average buyer, who gives preference to oysters of a white color. Watering the bivalves has a tendency to whiten them, although oysters naturally are of a grayish color. They may even have a slight greenish tinge. "I understand" said Walsh, "that in France they prefer a greenish or grayish oyster, but in the United States valuable beds have been abandoned because American consumers will not accept oysters of a green coloration.

"Virtually the same thing holds true for scallops and crabmeat. Unsoaked scallop, in its natural state, has a pinkish tinge, while natural crabmeat is slightly cream colored. The average buyer, however, wants his scallops and crabmeat to be white and this preference undoubtedly has something to do with the practice of washing and soaking crabmeat and scallops excessively."

Supervision of shipments of seafoods is not the most important project of the Baltimore Station, however, Walsh informs me that the canning industry furnishes the chief supervisory activities of his men. The largest pro-

duction of canned tomatoes in the United States comes from the territory of the Baltimore station. Peas, beans, spinach and corn are also canned in huge amounts and it is necessary for Walsh's men to make regular inspections of canning plants and to check on interstate shipments of canned foods in order to see that they are not adulterated or misbranded under the food law. You will get some idea of the size of this job when I tell you that there are approximately one thousand vegetable canneries in the territory of Baltimore station. Station officials have to determine that the raw materials used are sound and wholesome--- that water is not substituted for vegetables in the cans--- that the net weight is correctly declared on the labels of the cans--- that the packs meet the standards of quality required by the food and drugs act.

Examination of apples is one of Walsh's important fall problems. His territory, with the exception of the Pacific Northwest, is the largest apple-producing area in the United States. The annual production is upwards of 15 million bushels, which come from some 5,000 orchards. Now, as every farmer knows, it is necessary to spray apple trees for various diseases and insect pests. Lead arsenate is the spray most generally used and it is the problem of Federal enforcement officials to see that poisonous sprays, necessary to combat insects, are removed before the apples are shipped. Due to the educational work carried out by the Baltimore station and cooperating State officials, orchards have installed washers to remove this spray residue before the apples are packed. During the harvest season, inspectors are stationed in the apple-producing sections where, in cooperation with the State forces, they see that the washing is carried out effectively and faithfully. You may be surprised to learn that about 75 per cent of the apple crop in Baltimore station territory is shipped to Europe and South America. The same restrictions as to spray residue apply for apples for export as for those designed for domestic consumption.

The activities of Walsh and his men are not limited to supervisory control of the many varieties of foods produced in his territory. Another very important job is the analysis of drug products and the control of shipments of such articles. Baltimore station has a kind of special assignment to analyze drug samples sent in by other stations of the Administration. The station has a force of expert drug chemists who have been particularly trained for this work. These men analyze tablets, capsules, ampoules, and bottled and packed drugs and pharmaceuticals to determine that they are of the strength and character declared upon the label. Fluidextracts, tinctures, and other drug products listed in the U. S. Pharmacopoeia--- the standard under which drugs are judged under the food and drugs act--- are examined to see that they comply with the standards of the Pharmacopoeia. Your protection from this work comes from physicians being assured that the products which they administer to you are of full legal strength. You get further protection in that you are able to judge for yourself, if you are trained in reading labels, whether the product desired is of a nature to achieve the therapeutic action you want.

Ships from all over the world dock at Baltimore wharves. The principal foods imported through that tide-water port are spices, stockfeeds, canned and salted fish, dairy products, jellies and candies, dried vegetables and vegetable oils. Other imported goods include drugs and pharmaceuticals, and

insecticides and fungicides which, of course, must be inspected to see that they comply with the national law.

It is, of course, impossible to describe in 10 minutes all of the activities of the Baltimore station. I may have occasion to come back to Walsh's work later; but I want to invite you now to visit him and his men at the offices and laboratories at 218 Water Street. You will find them on the fourth floor.

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ANNOUNCEMENT: You have just heard the Veteran Inspector's latest service talk, broadcast by Station_____through the courtesy of the United States Department of Agriculture. He will be at the microphone at this hour again next Monday and you are invited to hear him.

UNITED STATES DEPARTMENT OF AGRICULTURE — Radio Service — OFFICE OF INFORMATION

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WITH UNCLE SAM'S NATURALISTS RELEASE Friday, February 12, 1932.

FOR BROADCAST USE ONLY

ANNOUNCEMENT: Now for our bi-weekly visit with Uncle Sam's Naturalists of the United States Department of Agriculture. Today, our Wildsman tells us about the lookout service for detecting and reporting insect outbreaks in our forests and big national parks ---- Well, Mr. Wildman?

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Well, you have all heard about fire fighting in our National Forests. You know about the system of lookouts for detecting fires. And the telephone lines through the woods for giving the alarm. And the crews of fire fighters that are rushed to the scene of action.

Of course, that is the most important and most spectacular part of forest protection. Keeping fires down is chief of the many jobs of our famous forest rangers. But Dr. F. C. Craighead, in charge of the forest insect division of the Bureau of Entomology, has been telling me about that lesser known, but still highly important, system of scouting by which insect outbreaks are discovered and reported throughout the vast stretches of timber in our national forests and our national parks.

Of course, you know insects at times do a tremendous amount of damage. Dr. Craighead points out that a tree is subject to attack by many different kinds of insects at different stages of its growth. There are insects which attack only the seedlings or baby trees. There are those which attack only young trees. Others attack only mature trees. Some go after the leaves. Other kinds infest twigs. Others are found attacking the limbs. While still others attack the bark on the trunk.

Different kinds of insects attack different kinds of trees. Some insects damage only one kind of timber. Trees of a different sort in the same stand are left undamaged. There seems to be an infinite variety to this life in the woods.

Of course, the insect legions also have their troubles. Some of them are preyed upon by other insects, by different kinds of birds; and we even have insect-eating animals. Weather conditions take their toll. Also the natural enemies of insects tend to keep them down so that some years the damage they do is not very noticeable. There are relatively few very destructive insects. Some of those, however, are very destructive. Some are strong fliers, others spread more slowly from tree to tree. They may sweep through a forest as a veritable plague. In a single season they may kill thousands of valuable timber trees and change a beautiful landscape

into a gaunt barren waste. If not checked promptly such an infestation may get beyond control, just as a fire sometimes gets out of control.

About five years ago, there was an outbreak of the spruce bud worm near the eastern entrance of the Yellowstone National Park. That outbreak threatened to destroy all the fir around the camp sites, and canyons, and dude ranches. The famous scenery of that section was saved from its apparent doom by prompt spraying with chemicals to kill those insects. In some cases, however, the forest and park administrators have been forced to resort to protection of a strip of timber along the road. You can't take elaborate spraying equipment through the thick of the forest, and even were that possible the cost would be prohibitive. In one place, Dr. Craighead mentioned, the tourist finds himself flanked by an apparently beautiful forest of unmeasured depth, but a thousand feet back through this scenic screen stretch miles upon miles of skeletons of a forest completely destroyed by insects.

The worst of tree-killing insects seem to be the various kinds of bark beetles, which burrow into the bark of the tree, and kill the tree in a single season. To stop the spread of some kinds of bark beetles it is necessary to fell the infested trees, strip off the bark and burn it. In case of thin-bark trees, the treatment is a little different. The worker equipped with a compressed-air sprayer sprays the tree with fuel oil; then ignites it, and scorches the bark and kills the beetles. In the case of the lodgepole pine beetle in the Crater National Park the infested tree is merely felled in a north and south direction. The heat of the sun kills the beetles. After a time, the workers return and turn over the log, given the sun a chance to kill off the beetles infesting the other side.

And, by the way, that lodgepole pine beetle threatens soon to destroy all the lodgepole pine in which the Yellowstone National Park and nearby forests are clothed. That devastating infestation started in the Blackfeet National Forest near the Canadian border in 1909 and has swept along since then taking all the mature lodgepole pine. It also attacks yellow pine, and western white pine, but doesn't attack fir, or even any young pines below 8 inches in diameter. In a stand of timber which is fifty per cent fir and fifty per cent lodgepole pine, that beetle will destroy the lodgepole pine and leave the fir. But then the Douglas fir beetle may come along and take the fir.

It is estimated that bark beetles in western states destroy six billion feet of timber, some $20,000,000 for lumber alone each year. This does not take into consideration the scenic value of such trees as lodgepole pine in national parks worth much more than that.

I just mention that to call your attention to what it sometimes means for an insect outbreak to get out of control. In the vast stretches of our national parks and national forests you can see at once, that it might be easy for insect outbreaks to gain considerable headway before being detected. That is the reason for this insect outlook service I mentioned awhile ago.

In that service, Dr. Craighead tells me, that the Bureau of Entomology cooperates with the United States Forest Service and the National Park Service. The men who first actually spot and report insect outbreaks

are our old friends, the keen-eyed forest rangers and park rangers. Of course, if they discover any alarming insect outbreak at any time, they report it promptly. But the discovery is not left merely to chance. Once a year each ranger makes a complete, systematic survey of his district, keeping on a sharp lookout for dying trees. He examines any he discovers for signs of insect damage, reports the conditions, and may send in one or more of the insects he suspects is the culprit. If a number of trees are infested he travels back and forth through the forest counting the damaged trees to determine the approximate area and extent of the damage.

Reports are forwarded from district forest or park headquarters to the nearest branch headquarters of the Bureau of Entomology. In the West, there is a district entomologist at Portland, Oregon, one at Berkley, California, and one at Coeur d'Alene, Idaho. If a report looks at all alarming, the entomologist may rush to the scene to inspect the trouble himself. The forest and park service officials are advised of the danger, and those officials determine whether the manaced timber or scenic value warrants the expense of fighting the insect in that particular area.

Of course, forest and park rangers are not always insect experts, Some are naturally more observant than others. But at the annual ranger schools, the entomologist trains these men in the method of making surveys, takes them into the forest and shows them the insect at work, and otherwise prepares them as insect scouts.

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ANNOUNCEMENT: You have just listened to an account of the forest insect surveys of the Bureau of Entomology, the United States Forest Service, and the National Park Service. Two weeks from today, we will have another visit with Uncle Sam's Naturalists.

UNITED STATES DEPARTMENT OF AGRICULTURE

Radio Service

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WITH UNCLE SAM'S NATURALISTS Friday, February 26, 1932

FOR BROADCAST USE ONLY

ANNOUNCEMENT: Now for another trip into the woods with Uncle Sam's Naturalists of the United States Department of Agriculture. Our Wildsman will lead us into the woods to get us out of the woods in some of our thinking about the woods -----Well, Mr. Wildsman? -----

******

Dr. W. B. Bell, of the United States Biological Survey, has been telling me about the plans for finding out more about how one kind of wild life affects another, or other, kinds. How plant life affects animal life, and how animal life affects plant growth.

Of course, you know that what we call the woods -- meaning the trees, and the grass, and the leaves, and the insects, and the birds, and the animals, and all the other forms of forest life -- make a mighty complicated subject. Most of us go to the forest, the field, or other haunts of wild life looking for one thing, noticing maybe a few others, and forming some vague general idea of it all. For instance, if we are hunting quail or rabbits, we are interested in finding out about their haunts and habits, but we are not apt to be so observant of other wild life. You know, you see what you look for.

No one man can know all of nature in all its relationships. Naturalists have been forced to specialize. When they have found their forest pet, as it were, being endangered by an overabundance of some other form of animal or plant life, they have thought of ways to control the despoilers. But the matter is not so simple as that.

For instance, Dr. Bell was telling me about the case of ruffed grouse, or pheasants. Grouse make mighty good eating. They are one of our best game birds, but, as you may know, they have proved to be quite a puzzle. Protected from hunters, they sometimes flourish like the proverbial green bay tree; they increase in numbers. Then suddenly they are gone ----- almost completely swept away over vast areas. Bacterial and parasitic diseases have been blamed for killing them off by the thousand. This raises many questions regarding the effect of weather conditions on life cycles and on rabbits or other animals that may harbor the agencies that cause the diseases in grouse.

Chipmunks and squirrels harvest seed crops from trees. What effect does this habit have? Is it good or bad? Some of the seed they put in the ground may sprout, but if they eat all the crop what is the forest to do for trees? Our foresters often find it necessary to seek out the seed stores of rodents in order to get seed to plant.

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Then there is the pocket gopher. Is the damage it does by its burrowing activities offset by the good it does in stirring up and working the soil and opening it up so the water can get down? That, you may guess, depends on where the burrowing is done, on the use made of the land, and on how many pocket gophers are at work. This last consideration brings up a question that hasn't been answered yet: What are the main causes of differences in numbers of different kinds of animals or plants at different times?

Woodpeckers are generally helpful to trees by destroying injurious insects. However, woodpeckers have been suspected at times of performing anything but sanitary tree surgery, for if one sticks his bill into a diseased tree, and then flies off to attack another tree, it may be responsible for spreading that disease.

On the Kaibab National Forest the mule deer became so numerous for a time that they overgrazed the range and threatened to destroy both the range and themselves in doing it, while other animals under the same sort of protection hardly increased in numbers at all.

Of course, all these relationships which I have merely brought to your attention have been studied for many years by scientists and scientific organizations here and there. But not enough and not fast enough to meet the need for information. It is to help out in these needed studies that the Biological Survey, under the provisions of the McNary-McSweeney Act, has recently mapped out a comprehensive program of research to find the facts about these complex relationships between many plants and animals.

Game management problems, for instance, have become prominent. Dr. Bell explains that it is becoming very evident that game management must play an important part in the future development and use of our game and wild life resources. But in order to manage properly we must know what we are doing. The first thing is to learn just what the conditions are, and what we have to deal with, in the various parts of the country. To that end, the Biological Survey now has several men in the field, making surveys to find out what wild life is actually here and what the animals are doing.

Don't get the idea that this is to be just a sort of still picture of what is on hand at any particular time; there are few still pictures in nature. The plan of the bureau is to keep constant track of the ever-shifting forces in nature and the varying changes that they cause. The program in its general features is a permanent program of research into the relationships of plants and animals in forest, field, and stream.

Consider beasts of prey, for instance. What are their good points and what their bad? What is their real value in keeping down the numbers of other animals from the standpoint of the health of those other species? What is the value of these predatory animals for fur? On the other hand, how about the harm they do? Are they unduly destructive to game, or livestock, or other forms of life? Then, too, there is the problem of disease among wild life, as well as among domestic animals and human beings. Furthermore, there is a serious possibility of diseases

spreading from wild animals to different forms of domestic stock and, of course, from domestic to wild. Even human beings are often endangered by diseased animals. Those relationships must be looked into more.

Of course, predatory animals are just one group: Rodents are another. There is a long list of things we need to know about rodents, from their breeding and feeding habits to their relation to grazing, erosion, and soil working. A wide variety of problems concerned with game and fur animals also is pressing for a better solution. How to keep up the game and fur supply and still be able to hunt and trap, and what places to be restocked, are big problems. And remember wild life does not grow in species-tight compartments. And of course, no one agency could run down all the ramifications.

For the first time, though, we now have a comprehensive program by which the work of the Biological Survey and other branches of the Department, as well as other institutions, throughout the country will be coordinated. Experienced field naturalists and trained biologists are at work to find the answer to these many baffling questions in forest-biology. The solution of these problems, as well as of new ones that are constantly arising, should benefit not only man in his industrial operations, but should aid him in conserving valuable forms of wild life and in controlling species having injurious tendencies.

ANNOUNCEMENT: The program you have just heard has come to you from the United States Department of Agriculture and Station_____. Two weeks from today we will have another visit with Uncle Sam's naturalists.

UNITED STATES DEPARTMENT OF AGRICULTURE

Radio Service

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WITH UNCLE SAM'S NATURALISTS

RELEASE Friday, March 11, 1932

FOR BROADCAST USE ONLY

ANNOUNCEMENT: Now for another visit with some of Uncle Sam's Naturalists of the United States Department of Agriculture. We get out in the wilds with these naturalists every other week at this same time ----------

******

We've been talking about the woods and the wide open spaces; about the birds, and the animals, and the insects; about the trees and the grasses, and the weeds. But Mr. William A. Dayton, of the range forage investigations of the United States Forest Service, reminds us we haven't said anything about the shrubs.

Shrubby, woody vine, and small tree vegetation is not of course, as much value for forage for livestock as the grasses, but Mr. Dayton says, it is of enormous importance, especially to our livestock industry under western range conditions. He says it is impossible to say how many separate species of these shrubby plants there are in the United States, or even in the West.

However, for the country as a whole, Mr. Dayton declares the number runs easily into the thousands. In the past 22 years, about 1,000 species of shrubs, undershrubs, and woody vines have been collected on national forest ranges and studied by forest officers, and more are being discovered every year.

In fact, Mr. Dayton points out, there are large areas of our national forests and other lands of the West that are still practically unexplored botanically.

And, when you come to think of it, western shrubs, are enormously varied in their distribution. You find them everywhere from the seashore, or even below sea level in such places as Death Valley, up to timber line, and even at the very limit of vegetation on our high mountains. You find them in the driest spots that vegetation can last, and in the wettest of water-logged bogs. Very few forms of plant life can stand as much alkali or salt as certain shrubs, yet you also commonly meet various bushes in the richest humus.

There are millions of acres of the chaparral types of plants in California alone. In parts of the Great Basin and the Rocky Mountain region generally you often come across vast stretches marked with sagebrush as far as the eye can reach. And the tremendous wastes of our southwestern desert support any number of highly specialized types of shrubby plants.

Often they grow in pure or nearly pure stands. More commonly, however,

you see them mixed in with other kinds of plants. For example, as an understory in the forest or as more or less scattered individuals in grass and weeds in parks, on foothills, and on mountain slopes. In the mountains of the West, shrubs are often met with at the lower elevations, as on the foothills, and lower plateaus, above or near timber line.

But what are they all good for? --- Well, that is a pretty big order, when we don't even know how many kinds there are. However, among the many uses, they serve to protect the watershed and conserve wild life. Some of them are poisonous. Others have medicinal properties. Others supply cordwood, edible fruits or nuts. To the range-wise forester or stockman, certain kinds serve as indicators or "ear marks" of overgrazed range, and planting sites, and of land fit for farming.

And, of course, from Mr. Dayton's viewpoint, one of their chief values is as browse for livestock, especially in times of drought and other feed shortage. Roughly speaking, he says, only about one in eighteen of the kinds of shrubs has very much forage value, but the number that are grazed to some extent at least under certain circumstances, is very great.

There is no rule by which you can tell a good browse plant from a poor one. As Mr. Dayton says, it is like the pudding in the adage, the proof is in the eating of it. In general, stock prefer the juicier kinds with the bigger and thinner leaves. And stock are much more likely to crop plants with bland juices like those of most of the rose and mallow families than they are to eat those of a bitter, acrid taste.

Yet some kinds of bitter-tasting foliage, such as that of bitter brush and cliffrose, the animals seem to like. You know the old saying, there is no disputing about taste. That is true enough about human tasto, and seems to be even more so about stock. In fact, Mr. Dayton says the more he knows about what plants livestock seem to relish, the more he is convinced that animals make chemical distinctions in bitterness that the human palate simply can not appreciate. They pass up somo types of bitterness and relish others apparently just as bitter.

Many shrubby plants, especially those of the goosofoot family,growing in alkaline or saline land, have a salty taste most stock seem to like. But animals seldom graze plants that have an acid flavor, and Mr. Dayton doubts wheter any western shrub with a milky juice is palatable to livestock.

Whether stock graze one sort of shrub or another depends a lot on the season of the year and what else is available. For instance, big sagebrush, on the higher summer ranges is seldom of much value as a forage plant. But on the lower ranges, where it is more plentiful and where its slender twigs, and big leaves and the flowering and fruiting heads are available to livestock through the late fall, and winter, and early spring, big sagebrush is often the mainstay ration. Sheep and goats especially take to it at such times. Cattle also browse it considerably, but less so than sheep. In fact, sheep sometimes get a "sage hunger" and often leave other feed alone for several days until they get enough sage.

Big sagebrush is not thought so much of in Washington State and much of Oregon, but it is highly esteemed in Nevada, and Utah, and Colorado, and

New Mexico. That, Mr. Dayton tells me, is largely because in the north big sagebrush occurs mostly on summer or early fall range. Its palatability and usefulness is much greater in the late fall, winter, and very early spring.

The most remarkable thing about big sagebrush, however, is its enormous root system, that reaches way down under ground for water and minerals. A vigorous growth of big sagebrush has long been used as an indicator of potential agricultural land, and has been very valuable in reclamation projects.

Mountain-mahogany, bitterbrush, cliffrose, and other of the rose family form probably the most important group of range browse plants. Yet in that same general rose family there are some that are practically worthless from the grazing standpoint.

In all this grazing business, the stockman and range official has to take into consideration not only one particular kind of plant grazed, but the effect the grazing of that plant on the grazing of other kinds plants.

Mountain mahogony, for instance, stands close grazing well, and some people claim that on the better sites it should be grazed closely enough to make the plants take on a bushy and more spreading form. But if that is done with any livestock except goats, Mr. Dayton says, it will cause overgrazing of herbaceous vegetation and result in erosion and serious lowering of the livestock carrying capacity of the range.

Each of the thousands of shrub species growing here, there, and yonder has an interesting story, according to Mr. Dayton. The pines, and the oaks, and the apples, and the honeysuckles, and the willows, and the heaths, the peas, and the beans, and several others all have representatives of their botanical families among the shrubs of the forest, or mountains or plains. It is surprising too, that although legumes are so important as forage for livestock, the members of that family among the shrubs on the range furnish little or no browse. But they do produce several kinds of poisonous plants.

ANNOUNCEMENT:

You have just listened to our feature called "With Uncle Sam's Naturalists" which was prepared by the United States Department of Agriculture. Two weeks from today we will again go out into the open and listen to Nature's teachings.

UNITED STATES DEPARTMENT OF AGRICULTURE — Radio Service — OFFICE OF INFORMATION

MAR 25 1932 U.S. Department of Agriculture

WITH UNCLE SAM'S NATURALISTS. RELEASE Friday, March 25, 1932

FOR BROADCAST USE ONLY

ANNOUNCEMENT: Good day and good luck! This is the day we tune in on Nature or what Uncle Sam's Naturalists of the United States Department of Agriculture have to say about it.

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Let's sing today with the wisest of men --- "Lo! the winter is past; the flowers appear on the earth; the time of the singing of birds is come."

If the music hasn't swelled to a grand chorus around your neighborhood yet, it won't be long now. Anyway W.L. McAtee, of the United States Biological Survey, has been giving me some good hints on how to improve my chances of getting an ear full of bird music and an eye full of feathered beauty. To say nothing, of the help of a number of active workers to keep down insect pests.

Mr. McAtee says that when you take proper measures to attract and protect birds, you can often increase the bird population several fold. And by doing that, you can cut down the losses from depredations of injurious insects.

Whoever said a bird in the hand is worth two in the bush, evidently overlooked the activity of those two in the bush gobbling up troublesome insects.

And, from what Mr. McAtee says, it seems to be a good idea to have a bush for that pair of birds to make their home in. Although a number of our native birds build their nests on the ground, most of them prefer to set up house-keeping in trees or shrubs-- in holes or on the limbs or in the crotches. For that reason, shrubbery and trees for nesting sites are needed to make the place attractive to birds.

If the kinds of trees and shrubs planted are chosen from among certain wild fruit-bearing species, they will serve a double purpose of providing some food as well as lodging for the birds, and will help protect domestic varieties of fruit.

However, to make shrubs more attractive for birds, Mr. McAtee suggests the shrubs be allowed to form thickets and that you prune them back

severely when they are young so as to produce a lot of crotches.

In these days of modern tree surgery, hole-nesting birds can't find so many tree hollows in which to live, but most of them take very well to bird houses.

When you see a house wren nesting in a discarded tin can, or an old hat, or the empty sleeve of a scarecrow, or the cranial cavity of a weathered cow's skull, you realize that bird-housing requirements are few and simple.

A bird house doesn't have to be anything elaborate. To make the nesting safer, and more attractive to the birds, however, Mr. McAtee suggests the bird house should be durable, rain-proof, cool, and readily accessible for cleaning.

Although we have more need for bird houses under present day conditions, this idea of providing nest boxes for birds is nothing new. Mr. McAtee says that early records of Asia Minor tell of the use of doves and pigeons for carrying messages, and that means they must have had houses for the birds. The shelves for swallows in Japanese temples and the feeding towers with nesting places maintained by the Brahmans of India must go back hundreds and even thousands of years.

In this country the early colonists found that American Indians of some of the more agricultural tribes of the eastern sections hung up gourds for purple martins on trees trimmed to bare stubs for the purpose. That practice has been kept up by white men in much the same form through the Southeastern States right down to the present hour. Since colonial times, folks in the Southeast have put up houses for purple martins and shelves for cliff swallows and barn swallows.

You know the Indians have always had the reputation of knowing a good bit about wild life. They evidently knew what they were doing when they trimmed those trees to bare stubs. Some folks put bird houses in untrimmed trees instead of on posts or poles and then wonder why the houses don't prove successful in increasing the number of birds around the place. Such a location may look more natural to some of us humans, but it evidently doesn't seem quite safe to the birds. And often you don't have to look further than that prowling beast of prey, the house cat, to find why birds prefer houses not so easily reached by their enemies on the ground.

Another cause of failure of some bird houses is that the entrance hole is made too small for the bird for which the box is intended. But if you want practical instructions on how to build a bird house, so as to make it comfortable and attractive to the birds you want about, I'd suggest you write the U.S. Department of Agriculture for Farmers' Bulletin No. 1456 on "Homes for Birds".

And in all this business of attracting birds, especially during hot weather, nothing works much better than drinking and bathing places. Mr. McAtee suggests that the bird's water supply should be a pool not more than a few inches deep, with the bottom gradually sloping upward toward the edge. The edge and the bottom should both be rough so to give the feathered drinker or bather a good safe footing.

A good comfortable, safe place to nest, and a good safe place to drink and bathe, and then something to eat. Plenty of food just before and during the nesting season tends to increase the number of eggs, and also the number of broods in a season. Well, there are two ways you can supply food. One way is just to put food out in artificial devices where the birds can get to it readily. That is most important in winter, but as Mr. McAtee remarks, winter feeding easily passes into summer feeding, and some birds gladly avail themselves throughout the year of that easy way of getting a living.

Another way of supplying bird food is by cultivating their natural food plants and letting them reap the harvest in their own way. Less has been done along that line for the true seed-eating birds than for those fond of pulpy fruits. The reason for that is that our seed-eating birds patronize weeds, which we do not care about cultivating, while the fruit eaters depend upon many plants which we cultivate anyway for their value as ornaments.

The United States Department of Agriculture will supply you with information about plants that can be used to attract both seed-eating and fruit-eating birds.

With plenty of food and water, and a good safe place to stay, why wouldn't the birds be attracted?

Of course, making the birds safe from their enemies is the prime requisite for increasing the number of the birds. If you want to establish a real bird sanctuary on your place, Mr. McAtee says the most effectual single step is to surround your bird refuge with a good cat-proof fence, one that can't be climbed, or dug under.

In case it is impractical for you to build an impenetrable fence to protect the birds, the next best thing is to put guards of sheet metal on all nesting trees and on poles supporting bird houses. You should do that anyway, if there is any danger of squirrels or snakes. It is seldom you can fence out squirrels or snakes. Put the tree guards on 6 feet or more above the ground.

If you want birds for their songs or service in keeping down insects, you can probably get them by following a few simple rules in providing protection, their favorite foods, and lodging.

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ANNOUNCEMENT: That bulletin on homes for birds is Farmers Bulletin No. 1456, and can be had free as long as the supply lasts. Write for it either to this station or direct to the United States Department of Agriculture, at Washington, D. C.

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WITH UNCLE SAM'S NATURALISTS

RELEASE Friday, April 8, 1932

FOR BROADCAST USE ONLY

ANNOUNCEMENT: Now is our time with Uncle Sam's Naturalists of the United States Department of Agriculture. Today we have a few suggestions about the woods from one of our foresters.

*****

"Come forth into the light of things,
Let nature be your teacher." -----

So says the poet, and so says Extension Forester W. R. Mattoon of the United States Forest Service. Only Mr. Mattoon says it in prose, and with particular reference to the trees.

Of course, some of us spend a good bit of time in the woods all the year around. But I guess more folks get the urge to get out into the woods at this time of the year than most any other. Even people who are content to stick around the house or stay in town at other times, seem to be drawn toward the woodland in the spring. Many of us don't get out for a good long stay in the forest until well along into summer. In the spring, however, we get that hankering to at least get out and explore around a little in whatever wood we can reach.

And Mr. Mattoon suggests that those who have little knowledge of woodcraft might do well to get better acquainted with the ways of the woods. In fact, he says it is essential that our people know the importance and value of many forest tracts of small size that make up our farm woodlands.

It is certainly a facinating subject once you get into it. Folks who are used to just drinking in the beauties of Nature without much attention to the details, might start by getting acquainted with the different kinds of trees. Learn to distinguish the different kinds of trees by some of their well-marked characteristics of leaf, and bark, and fruit, and seed, and buds and twig arrangement.

Of course, everybody probably knows some of the trees in their locality, but you will be surprised how many you pass up or don't really know. I know I was.

Now that spring is coming up this way and the buds are bursting, don't forget the flowers of the forest trees. As Mr. Mattoon points out to me, the flowers of our trees form a clock dial for the advancing year. So, as they bloom in succession, note the blossoms of the willow, the maple, the elm, and

the cottonwood, until the last flower blooms in June, and seed are on the wing. Or maybe you don't have those trees in your woods? What trees do you have in your neighborhood? I'll venture to say there are a lot of you who have been enjoying trips through the woods for years, who don't really know the names of all the common kinds of trees. Test yourself on this.

And while you are getting acquainted with the different trees, you will probably notice that certain trees prefer certain localities. As you know, you find the willow by the stream, the yellow or tulip poplar in the valley, the red oak on higher ground. One kind of tree needs a lot of moisture while another will grow in a drier situation.

As you have probably noticed certain trees "hobnob" together because they have similar needs in the way of soil, and moisture, and light and the like. You soon learn to group your trees as belonging to certain types. There are certain trees you find associated together on the ridges. Other groups you notice on the slopes. Others you find hobnobbing on bottom-land. Others seem to prefer the swamps.

What is your favorite woods? Is it the coniferous forest type? If so, what kind of cone-bearing trees do you find in it? Or maybe it is the pure hardwood type. Or maybe a mixed hardwood and conifer type. Did you ever stop to figure why that woods is the kind it is?

And did you ever try to figure how some of the trees in the woods got where they are? You know forests have been traveling about long before the famous Birnam wood came to Dunsinane. Some trees travel by wind. That is, the seed are scattered by the wind. And you have probably noticed a good many of those ingenious contrivances with which some of the seed are equipped for getting about.

Some trees travel by animal. For instance, squirrels play an important part in spreading the seed of certain trees. Hickories, walnuts, butternuts, oaks, honeylocust, persimmons, and beeches are among the trees spread by animals. Birds also carry such tree seed as red cedar and cherry from place to place. While such trees as cypress, tupelo gum, cottonwood, willows, maples, and a number of others are spread by water. Sometimes when you see a certain kind of tree growing along a stream or a fence-row it is pretty easy to figure how it got there.

When you go into the cool shade of the woods, note the forest floor too. Note the undergrowth of young trees and shrubs and ferns and moss, and the litter of fallen leaves. Take your jackknife or a stick and dig right down under that cover into the mold of many years of fallen leaves. There you will find the answer to Villon's question "Where are the snows of yesteryear?"

When rain falls or snow melts under the shadow of the forest it sinks into the spongy earth. The forest has soaked up the rain and melted snow like a sponge. Find a spring, and you will see where the stored water is seeping out to feed the streams. The rainfall and snowfall that has been held back in the hidden reservoir of the forest has been transformed into a steady supply of water for the pasture, and the farm, and the mill, and the city.

Go out into the open and dig into the soil of an unwooded slope and notice the difference between that and what you found in the woods soil. Chances are you will find the soil on that unwooded slope dry and hard. Of course, you know what has happened. When the rain fell or the snow melted on that open hillside, there was nothing to hold it back. It just rushes down hill.

Maybe if you look around on the open hillside, you may find places where the soil, with no roots to bind it, has been washed away by the rain. If there are any steep slopes in the neighborhood, you may find deep gullies dug into the ground. Trace where that soil goes that is washed down the slope.

When you have noted those facts about the trees, the soil, and the stream you begin to see the relation which the forests of our country bear to the well-being of our land. In a little strip of woodland and neighboring cleared land, you may have an example in miniature of soil protection and good streams, or erosion and flood damage, and get a clearer understanding of the larger meaning of this Nation's forests to farm land and industry and commerce.

Or if you are of a investigative turn of mind, and want to find out about the past life in the woods, you may be able to detect in some stump or the end of the saw-log much of the story of the past of that woods. In the varying thicknesses of the annual rings is written the fat and thin years of the tree. In those rings, you may also find evidences of fires and insect attacks which have occurred in the life of that tree. By counting the growth rings, from the bark back to the scar left by the fire in some cases you may be able to tell about what year that fire happened.

In fact, whether you are a novice or a woodsman of long experience, there is a lot that the trees can tell you. As for myself,

"I will up and get me away where the hawk is wheeling
Lone and high,
And the slow clouds go by.
I will get me away to the waters that glass
The clouds as they pass.
I will get me away to the woods."

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ANNOUNCEMENT: You have just heard a few suggestions on getting better acquainted with the woods. This program has come to you from the United States Department of Agriculture. Two weeks from today we will again go with Uncle Sam's Naturalists into fresh fields and pastures new.

UNITED STATES DEPARTMENT OF AGRICULTURE Radio Service OFFICE OF INFORMATION

WITH UNCLE SAM'S NATURALISTS RELEASE Friday, April 22, 1932

FOR BROADCAST USE ONLY

ANNOUNCEMENT: Again we turn to Uncle Sam's Naturalists of the United States Department of Agriculture. Again we catch on the wing a few facts about outdoor life. This time it is a wild night life which you may notice most any spring night-----

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If you want to do a little original research in the ways of the wild, here is a subject for you: Bats.

Mr. Vernon Bailey, of the United States Biological Survey, tells me that we know probably less about bats than about almost any other order of animals. He suggests that close and patient study of bat colonies, of groups of bats, or even of single bats found roosting in accessible places might repay you with some new and useful information.

What we do know has been largely picked up by studying individual bats seen flitting about at twilight and around camp fires at night or occasionally fluttering into lighted rooms through the open windows. Something of the habits of bats has also been learned by examining specimens shot down during the early evenings, or found hanging head downward from the roofs of caves or dark attics, or tucked away in hollow walls or under boards or the bark of trees.

Many people seem to have a horror of bats. When a bat comes in, they get out and get out quickly. To them a bat is a darting terror. Of course, no one in this audience has that eerie feeling at sight of a bat. None of you even picture bats as attendant on witches and ghosts and hobgoblins. It is little wonder that those notions got started. Here is a flying mammal glimpsed ordinarily only at night. By day, it is gone, often disappearing completely, as if the earth had swallowed it up. And, literally that is what has happened in many cases, for many of our bats are cave dwellers. Others hide away in clefts of the rocks, in dark places in buildings or trees, or under cover of dense foliage.

Then another characteristic of bats to which they probably owe a good bit of their awesomeness is that sudden turning and darting while in flight.

Yet that erratic movement is one of the important habits of bats, for it is done in catching insects on the wing.

Insects, Mr. Bailey tells me, form the entire food supply of our northern bats. None of the fruit-eating bats or the blood-sucking vampires of the Tropics reach the borders of the United States. In fact, Mr. Bailey has concluded from his studies that the bats we have in this country are almost as essential to successful agriculture as are the birds, so beneficial are they in destroying crop insects.

With birds working in the daytime and bats taking care of the insects on the night shift, we certainly have valuable help in our fight against the insects. Many of the night-flying insects, especially moths and beetles, are not easily found by the daylight birds, and the importance of bats in keeping a check on the increase of many destructive groups of insects, Mr. Bailey says, is beyond calculation.

When you realize that those tiny eyes of the bat are probably little or no help in its swift insect hunts, you begin to realize how wonderfully sensitive the big ears and the wide expanse of sensitive wing membranes must be to enable a bat to catch insects on the wing.

Yet so successful are these hunts that a bat brought down even a few minutes after it has come out of hiding is usually well filled with insects. And a bat seems to keep up its hunt throughout much of the night.

I say "a bat" and most of us probably think of bats in ones and twos and threes. But Mr. Bailey tells me that in many localities there are many more bats than there are insectivorous birds. When you run across a lone bat hanging upside down in the attic, it is hard to picture the caves with walls and ceilings literally covered with hundreds of thousands and even millions of bats.

Mr. Bailey studied a colony living in the great Carlsbad Cave in New Mexico, where millions of bats have roosted under a great arched roof of rock for ages. Early in autumn they gather in vast numbers for winter sleep. Then in early spring they wake up and start out on their nightly hunts for insects. Mr. Bailey saw about 12,000 leaving the cave one evening, and he figures that those were just the summer boarders and not the main colony. The summer before, some folks reported that the bats came out each evening in a black cloud visible two miles away and kept pouring out of the 50-foot throat of the cave for two hours. There must have been literally millions of them.

Well, millions of bats, each bat snapping up insects all through the night, must account for a tremendous number of insects. Bats that Mr. Bailey kept in his cabin seemed to live comfortably on the numerous big gray "candle moths" there. Fortunately, bats are neither edible nor ornamental, nor is any money value likely to be attached to them in a way that will help to exterminate any of the different species. So this night force of insect eaters will go right on helping us, even though some people do continue to have fits of terror every time one of these helpful little night workers flits across their sight.

That may be only a mother bat with her young clinging to her while she turns and darts through the air in her search for food. Yes, sir, Mr.

Bailey tells me he has brought down specimens on the wing with the young clinging to them. Imagine the baby aviator riding on such a stunt flight as that of a mother bat in hot pursuit of her dodging prey! If there are any thrills in flying for a bat, the young must get them early! There are records, Mr. Bailey says, of old bats taken with two and even four young clinging to the mother, but one seems to be the regular number with most species.

Bats hanging upside down, as they do in the daytime may seem odd and foolish to you. But Mr. Bailey points out that if you hold a bat in that position, you can notice that the folded wing forms a pocket or cradle where the little nursing baby bats can rest without even holding on.

Part of the time we have been talking about bats as if they were all the same kind; but, of course, there are different kinds of bats just as there are different kinds of birds, though there are not as many varieties of bats.

In bats from regions with mild climates, the inside of the wing which forms the resting cradle for the young is either entirely naked or has only the bottom of the pocket fur lined. In some of the more northern bats, however, that folded-wing cradle is well lined with soft fur.

The young bats, however, can fly for themselves before they are full grown and they don't need their fur-lined cradles and winged baby carriages long.

Many bats migrate from one region to another, as do birds, but we know very little about the comings and goings of our different species of bats.

Some live in caves, others, such as the pigmy or little canyon bats of the Southwest, are rarely found far from the rocky walls of canyons or cliffs. Others, such as the big hoary bats, are usually found within reach of timber and spend the day hanging in the dense foliage of the trees. The brown bats are forest bats too; they are also found around buildings, but not around cliffs or caves. On the other hand, some of the so-called "house" bats are also known to be cave bats.

All of them, in this country, eat only insects, and when twilight comes they set out on the nightly air hunt. The first thing most of them do is to head for water. They apparently wake thirsty, and make a bee-line for water, where they skim over the surface and in a few dips scoop up enough to satisfy them. Then they are ready to police our airways against destructive insects.

Because bats operate under cloak of darkness, many of their habits are still unknown. But from what we do know of them, it seems that they are more fit to be classed with the good fairies than with the witches.

ANNOUNCEMENT: The program to which you have just listened is a presentation of Station _____and the United States Department of Agriculture. We will have another visit with Uncle Sam's Naturalists two weeks from today.

UNITED STATES DEPARTMENT OF AGRICULTURE

Radio Service

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WITH UNCLE SAM'S NATURALISTS

RELEASE Friday, May 6, 1932

FOR BROADCAST USE ONLY

ANNOUNCEMENT: Now let's hear what Uncle Sam's Naturalists of the United States Department of Agriculture have to say about our wild life. Today we will catch some facts on the wing --- this time about birds -----

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Since man took to the air, birds have lost some of their big reputation as flyers.

Mr. Frederick C. Lincoln, of the United States Biological Survey, tells me that airplane and automobile speedometers have had a lot to do with paring down the speed ratings of birds. Accurate measurements of bird flights have cut down many of the old estimates considerably.

Not so many years ago, Mr. Lincoln says, some birds were credited with making tremendous speed. That was not a mere popular fancy, either. The notion was shared by many scientists and experienced sportsmen who had made a practice of estimating how fast the birds move.

It was rather generally held that many birds normally flew 100, 150, 180, and even 240 miles an hour. Of course, some birds do get up and move through the air, especially when they are scared. But accurate timing of birds in full flight, Mr. Lincoln declares, shows that often old claims were several jumps ahead of the true speeds.

With the advent of the automobile, it became easy to check up on such birds as sparrows, and horned larks, and warblers, and thrushes, and wrens, and other weak-winged birds which often fly low along the road parallel to motor traffic.

Readings of speedometers soon showed that some of those birds that had been supposed to travel from 40 to 60 miles an hour, normally make only about 18 to 25 miles an hour.

Stronger flying, stream-line-model birds such as the mourning-dove were found to move at the rate of 30 to 35 miles an hour.

With the help of the airplane, many checks have been made on higher flying birds, such as ducks and geese. Instead of moving ordinarily at rates of 100 to 150 miles an hour, as some folks had figured, ducks and geese were found to fly commonly at 40 to 60 miles an hour.

There are mighty few birds that fly a mile a minute, Mr. Lincoln says, although when scared and flying with the throttle wide-open as it were, many step up their speed considerably above the normal rate.

For instance, Mr. Lincoln has the record of a European vulture pursued in an airplane that flew 110 miles an hour for a considerable distance. However, the swifts are probably the swiftest of birds. In Mesopotamia a swift was observed literally to fly rings around an airplane moving at a speed of 80 miles an hour.

Mr. Lincoln says from his observation of the cloud swift of the West Indies and Central America, a swift as big as our sparrow-hawk, he can readily believe that its normal flight must be close to 100 miles an hour.

However, among the larger birds of this country, Mr. Lincoln saves his highest admiration for the duck hawk. Nothing in feathers, in this country can beat a duck-hawk. A duck hawk has such flight superiority that it can fly down the fastest, most frightened duck with little or no trouble.

And when a duck hawk is in sight, many other birds refuse to take the air. When the duck hawk swoops, the avocet, for instance, crouches on the ground rather than try to escape by flight.

The duck hawk, Mr. Lincoln tells me, is the American representative of the king of falcons, the famous Peregrine falcon, which in the Middle Ages was the falcon of kings. In fact, he says that it takes an expert to tell the American duck hawk from its more celebrated European cousin. In days of old, when falconry was in vogue, these hawks were used not only for bringing down game, but also in war for intercepting messages sent by carrier pigeon.

Of course, when we mention big birds, we naturally think of the eagle. But an eagle is not particularly fast as a flyer, except when it zooms down to catch its prey. The eagle is a soaring bird. While duck-hawks may be compared to the pursuit planes of an aerial fleet, the eagles and buzzards represent the gliders. In fact, they frequently operate on the same principle as the glider; that is, by taking advantage of the rising currents of air and riding on them.

Getting back to the subject of speed in flying however, Mr. Lincoln points out that not only have our ideas of the speed of individual birds been revised by accurate timing, but the older notions of mass migrations of birds have also undergone change.

Many early naturalists held that bird migration took place at a much faster rate than we now know to be the case. For instance, until comparatively recently, it was frequently believed that some birds flew from Africa to northern Europe and from Canada to South America in one swift overnight flight.

From bird banding, and other evidence, we now know, however, that most bird migration is a rather leisurely affair. The birds as a rule move from place to place in short hops rather than in one long non-stop flight. Warblers and thrushes, for instance, travel about 20 miles an hour. But even at that in flights of eight or nine hours at a time, it doesn't take many days for them to pass from their winter range to their summer home. As they find things to their liking they may linger on the way.

Other birds have other migration habits and move at other rates, but as a general thing, the different kinds of birds move along their course in waves, with a number of stop-overs during the trip. The famous golden plovers, however, are still supposed to make non-stop flights of 2,000 miles from Labrador to the West Indies and from Alaska to Hawaii, and back again.

As far as there is any record, no golden plover has ever been seen to light upon the water along the course of its migration. However, Mr. Lincoln says that it is well worth noting that the golden plover and all the other apparently non-stop long-distance fliers are water birds that could rest on the surface of the water and take off again. Until the golden plover is caught in that act, however, it will probably continue to hold undisputed championship among birds for non-stop distance flights.

And now just another word on the modification of old notions. It was believed that most bird migrations took place 15,000 feet or more above the earth. The people argued themselves into that by the idea that as the air is rarer aloft, flying would be easier. Since we have taken to the air ourselves, however, we have found out that it is really harder to fly in the rarer upper regions. We need air to support our planes.

Of course, the birds have undoubtedly known that ever since the flying business was in the fledgling stage. Since there is nothing to gain by going way up, most bird migrations probably take place at a height not exceeding 3,000 to 5,000 feet. That depends, of course, on the birds. The weaker migrants travel at only a few hundred feet up; just high enough to clear obstacles.

Mr. Lincoln recalls that before the City of Washington became so well lighted as it is now, hundreds of warblers, thrushes, tanagiers, and other birds were often found dead at the foot of the Washington Monument on mornings following the migrations.

But if newer knowledge has pared the height, and rate, and speed estimates of bird flight, that knowledge has brought the birds closer to us, and us to a closer understanding of them, and it has renewed interest in bird migration and flight.

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ANNOUNCEMENT: You have just listened to the feature known as With Uncle Sam's Naturalists, presented once every two weeks through the cooperation of Station _____ and the United States Department of Agriculture.

UNITED STATES DEPARTMENT OF AGRICULTURE

Radio Service

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★ MAY 20 1932

U S. . of Agriculture

WITH UNCLE SAM'S NATURALISTS. RELEASE Friday, May 20, 1932

FOR BROADCAST USE ONLY

ANNOUNCEMENT: Again we join the trek into the woods with Uncle Sam's Naturalists of the United States Department of Agriculture. But from what the specialists say, we are not alone.

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The thicker people get in the cities, the more of them there are who want to get into the woods.

Dana Parkinson, of the United States Forest Service, says the number of visitors to our national forests has jumped 1,000 per cent in the past fifteen years.

As Mr. Parkinson points out, more and more of our people seem to be learning the value of outdoor recreation and are feeling the need for it.

There's no question about it. The "sounding silences" of the forest primeval often give us sweet relief from the noises of the city. --- At least, after the first night or two in camp, anyway. A group of trees, a green mountainside, a good supply of game, all give us refreshment and diversion.

But according to Mr. Parkinson, and I guess he is right about it, all us folks who love the outdoors, and get into the mountains or the forests whenever we can, want the forest resources conserved. Some folks even insist that there should be no cutting of timber, no grazing, and no hunting whatsoever in our national forests. Of course, the idea of trying to preserve our forest life in all its beauty is mighty fine. But just letting nature take its course, doesn't always get the results you really want. Instead of preserving the forest, you may be doing just the opposite.

Forester Parkinson just calls our attention to what happens if man never fells a tree in the forest. If no trees are cut, he says, often 30 or more seedlings start to a square foot. That's over 100,000 trees to the acre.

You know what has to happen. Those 100,000 trees are in a killing competition for what light and moisture and soil food there is. Many of those trees must die and be wasted before others can get room enough to grow to large size. Eventually, old age, fungi, insects or fire will get what are left.

Mr. Parkinson sees very little advantage in that sort of protection. If on the other hand, man harvests and uses the surplus and nature trees be-

fore they rot, the trees that are left can grow faster. Harvesting trees properly, he claims, need not mar the beauty of the landscape.

Livestock grazing in the forest also has its good side as well as its bad. Any of you who have seen mountainsides laid bare, and water polluted, and camp grounds damaged by livestock, on hot and hasty first thought may condemn the whole idea of using any part of our forests for livestock. However, there are millions of acres in the West which produce valuable forage that in many cases can be used without harm to either the recreational or aesthetic values. In fact, Mr. Parkinson reminds us that grazing cattle often draw our attention to beautiful mountain meadows, and bands of well-managed sheep grazing peacefully on the slopes add life to our mountain scenery.

Some folks, however, prefer wilds wild and would even shut hunters out of the forests. And, the ruthless destruction of big game has brought about the closing of large areas to hunting. Yet even that sort of protection has its dangers. Game must eat. Their range can not be overstocked without damage. Regulated use of surplus game is absolutely essential, Mr. Parkinson declares. Otherwise, he says, herds of wild game may grow so large that they will suffer from shortages of food, reduction in the rate of increase, and from disease. So you see even the wild life must be managed properly to keep our forests in best shape for their fullest enjoyment.

As this forest specialist points out, a scientific interest in making trees grow better and faster, and an understanding of the difference between wise use and useless waste, really brings an added pleasure to forest recreation.

Speaking of things not being always so simple as they seem, reminds me of what another forester says about restoring forest land to forests.

Some of my friends seem to think that reforestation of land that has been deforested by fire or whatnot is a simple matter. They would probably be interested very much in hearing what this Mr. L. S. Gross, of our eastern forests region, has to say on that score. They would find that there is more to forest planting than merely sticking trees in the ground. He says that in many cases in our eastern and southern national forests, repeated fires have destroyed seed trees and reproduction and seriously lowered the productive capacity of the soil. Under such conditions, such weeds as pin cherry, hercules club, sassafras, and scrub oak often cover such areas, and briars, annual weeds, grasses, ferns, and mosses are abundant.

Of course, under such circumstances, Nature left to herself won't reforest the land with valuable timber trees, because the seed trees are lacking and the seed bed is unsuitable.

Of course, any reforestation program calls for an adequate supply of seed. And right there the practical forester often runs into trouble. Many of our species of trees grow over a wide geographic range. You might think that seed from that same kind of tree would be all right to use anywhere that kind of tree grows.

However, Mr. Gross tells me that it has been proved that seed from the southern part of the range of a certain kind of tree is not suited for use for planting in a decidedly more severe climate. For that reason, seed must be

collected from thrifty trees in a location climatically similar to the area on which the young trees are to be planted.

Planting stock must be lifted from the nursery just before the planting season. It must be counted, sorted, and bundled and packed and shipped by train or truck to the planting site. That planting site itself often presents a problem. For instance, on the Allegheny National Forest in Pennsylvania, the brush, if not too dense, provides some protection for the planted trees, and does not greatly hinder the work of planting. But the ground cover, especially the mass of roots in the top layer of the soil, not only makes the planting difficult, but lessens the moisture available for the planted trees. Planting must be carefully done to secure good survival.

Then in that National Forest, there are the deer to be reckoned with. They cause considerable injury by browsing the young trees. So much so, Mr. Gross says, that areas which show evidence of intensive use by deer should not be planted.

Diseases, insects, porcupines, and rabbits may also destroy the newly planted trees. And, of course, severe drought may cause heavy losses in plantations. The weak trees and those that are poorly planted are less likely to survive such extreme conditions than the thrifty, well-planted trees.

But Mr. Gross declares that fire is the most serious enemy of the planted forests. To protect the plantations of trees, firebreaks, roads and trails must be built. And during dangerous fire-weather periods, lookouts and supplementary patrols must be provided.

And those are just a few of the many things which must be considered in re-foresting work. Taken all in all, artificial restoration of the forest, is a very complicated job.

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ANNOUNCEMENT: Two weeks from today we will have another visit with Uncle Sam's Naturalists of the United States Department of Agriculture.

UNITED STATES DEPARTMENT OF AGRICULTURE

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★ JUN 1 1932 ★
U. S. Department of Agriculture

WITH UNCLE SAM'S NATURALISTS RELEASE, Friday, June 3, 1932

FOR BROADCAST USE ONLY

ANNOUNCEMENT: Now let's go out in the fields and woods with Uncle Sam's Naturalists of the United States Department of Agriculture. The call of the wild is pretty strong these days ---- Listen! --- Can't you hear those birds? -----

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Anybody who tramps the fields, or roams the woods, or wades the sloughs, or paddles or rows along any stream or lake knows some of our living birds by sight and sound at least.

In fact, even folks who never get out recognize a good many of them. With all the beautifully colored picture books on birds, it is a simple matter to learn the names of many of our birds and to identify them.

However, Dr. W. B. Bell, in charge of the Division of Biological Investigations of the United States Biological Survey, says many folks could get a lot more pleasure out of their trips to the wilds if they would get really acquainted with the birds. They would also then see the vital importance of protecting the birds and in some measure supplying their needs.

To-day I am going to give you Dr. Bell's plan. It may help you enjoy finding out what an important part birds play in the life of the wild; and in our own lives, for that matter.

Of course, the best times to locate the birds are in the morning and late afternoon and evening. You probably know the best localities in your vicinity for finding them. But don't confine yourself entirely to such places. Dress in colors that are plain and that tend to blend with your surroundings. If you have an opera or field-glass, it may come in handy in making out details in your spying on the birds. And always take along a small pocket note book and a pencil to jot down the facts as you find them.

Move slowly and quietyly. In fact, it is a good idea to stop often and stay perfectly still. Keep the sun at your back as much as possible, so you can see colors clearly. Note whether the colors of the bird blend with the surroundings. Be alert to every movement and sound.

You won't want to confine yourself to birds at rest. Learn to bring down the facts on the wing, as it were. However, Dr. Bell suggests that when you get a chance you should note the size, and form, and general color, and any special markings, such as spots or stripes or bars or borders or bands on the bird's head, and back, and breast, and wings, and tail. Notice the length and shape of the bill, the neck, the wings, the body, tail, legs, and toes. Some bird investigators carry crayons or colored pencils and sketch the birds as nearly as possible in the natural colors to fix these features in the memory.

Note whether the bird walks, runs, hops, or swims. When you saw it, was it on a tree trunk, among the limbs or leaves, on the ground or in the air or water?

Watch its take off. Note how it starts its flight, and whether that flight is light or heavy. Notice whether the wings are flapped constantly or at intervals with a glide in between. If the wings are flapped at intervals, how does the bird hold them in the meantime.

There are a lot of these points also that are very useful in learning to recognize birds in the air at sight.

Does the bird soar? Is its flight in a straight line, an undulating line, a zig-zag, or a circle? How does it carry its legs and neck during the flight? Does it usually fly singly or in flocks? With some birds you will find this varies with the season; so you need to date the notes you take.

Then another important point is how far the bird flies. That is, does it usually fly long or short distances?

Watch the way it alights. Some birds land lightly and well-balanced. Others make more awkward landings. Some seem to have a hard time adjusting wings and feathers after alighting. Also note where the bird alights - in trees, on the ground, or in the water. If it alights in water, does it come down with a splash, a dip, or does it settle gently on the water?

Then there is the matter of the way it takes food. Does it catch insects or other prey in the air, from the surface of the ground, or beneath water?

This matter of food habits is one of the most important things to know about birds. The usefulness of the different kinds of birds is largely a question of what they eat and where they get their food. Controversies as to whether any particular kind of bird should be protected or exterminated most often rage about whether their beneficial food habits outweigh their destructive habits.

For instance, do they eat weed seeds, or grain or insects or such rodents as mice and pocket gophers? Do they eat standing grain, grain in the shock, or merely scattered waste grain. On that point, Dr. Bell suggests that you be sure to find out whether they are really eating grain or picking off insects. Those field glasses may help in deciding that point.

It is also important to know just what insects a bird eats. Are the insects they eat the ones that damage crops, or gardens or trees? There are all sorts of ramifications to an investigation of birds. You can make your investigations just as simple or just as complete as you care to. Anyway you do it you can get a lot of real enjoyment from finding out first hand about the birds around you.

Of course, one of the first things to note about the bird is where it lives. That is, whether it lives on the uplands, or on the water, or along the border of streams, or sloughs, or lakes. Does it frequent grain fields, or woods, or meadows.

During the nesting season, you will, of course, want to look in on the home life of the birds. Make a note of the day you observe the birds building a nest, and the materials used. Does this particular bird build its nest in a tree or in a shrub? Does this other bird build on the ground or in the grass. However, Dr. Bell warns that in studying the nesting habits, be careful not to frighten the parent birds or injure the nest eggs. Never handle the eggs.

We could go on indefinitely making suggestions as to things to observe about birds. But once you get interested in birds, your own desire to know will suggest plenty of things to you.

And there is probably no necessity to suggest to radio listeners that they tune in on the music of birds. Your note books will probably have plenty of facinating facts that, literally speaking, the "little birds have told you."

You will not only learn to recognize the different birds by their notes and calls, but I venture to say you will try to imitate the various songs, and cries, and call-notes, and notes of alarm, and scolding, and so forth, before you have gone very far.

If the same bird has different songs for different times of the day or seasons of the year, you will soon detect that fact when you begin to get well acquainted with them. You will note when they sing, and where they sing. If a bird sings or chatters while feeding, that fact will be recorded among the other facts about that bird.

In that way, Dr. Bell assures me, you will soon learn to understand and interpret more fully the sounds and music you have been accustomed to hear in your rambles through the fields and woods -----Just a moment, now----

Listen! ---------Do you hear that? -----The birds are calling you.

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ANNOUNCEMENT: You have just heard a few suggestions on getting better acquainted with the birds. This program has come to you from the United States Department of Agriculture. Two weeks from today we will again be with Uncle Sam's Naturalists.

UNITED STATES DEPARTMENT OF AGRICULTURE
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★ JUN 1 1932
U. S. Department of Agriculture

WITH UNCLE SAM'S NATURALISTS RELEASE, Friday, June 17, 1932

FOR BROADCAST USE ONLY

ANNOUNCEMENT: Now let's listen to the call of the wild. Again we turn to Uncle Sam's Naturalists of the United States Department of Agriculture for help in stalking a few facts, about some of our beasts of prey.

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With Mr. Stanley P. Young, of the United States Biological Survey, as our guide, the first tracks we strike today are those of a mountain lion.

Maybe you call that biggest, most powerful of American cats, a puma, or a cougar, or a panther. Mr. Young tells me that the mountain lion is known by all those different names on different parts of its range. As "mountain lion" is what it is called on probably a bigger part of its range, the Biological Survey specialists usually refer to it by that name.

Regardless of what you call it, Mr. Young says, that big cat is a highly interesting form of wild life. Of course, it is a killer, and lives on its kill. Often mountain lions kill deer and livestock in such numbers that special government hunters and trappers are sent out to get the individual lions causing the trouble.

In spite of the necessity for such hunts to protect livestock, Mr. Young says that we will probably always have mountain lions. He says there are lots of areas where a normal amount of hunting and disease and other visisitudes of the wild can generally be depended on to keep the number of mountain lions down within reasonable limits. There are thousands of acres, he figures, which will probably never be touched by any lion-control campaigns.

The favorite game of these big 150 to 200 pound cats is deer. The poor deer has little chance once a mountain lion pounces on it. Those sickle-like claws and razor-like teeth, backed by those powerful neck and shoulder muscles, soon rip the life out of the defenseless deer.

Among domestic livestock, young colts seem to be the favorite food of these tawny predators. In fact, Mr. Young says, many stockmen have given

up trying to raise colts where there are mountain lions.

Mountain lions most often live in the rougher, more inaccessible areas of mountain canyons. They find not only their prey in such places but also places to live and breed with least disturbance. One of the most striking things about these animals is the distance they will go to get their prey. Mr. Young estimates that they often travel 20 to 25 miles a night, and many have been known to travel further than that without resting for any appreciable length of time.

Their remarkable endurance makes hunting them an activity that takes stamina and strength. One of the Biological Survey hunters recently started on the fresh track of a mountain lion at 7 o'clock in the morning, and pushed on until 5 o'clock that afternoon before he caught up and treed the big cat.

Kentucky fox hounds and a breed that is a cross between the Walker hound and the bloodhound have been found most satisfactory for hunting mountain lions. However, any good dog may tree one of these biggest of cats. If the mountain lion doesn't tree, the hunter better not be far behind his dogs or he stands a chance of losing some of them. When a mountain lion chooses to fight, he can use those terrible weapons of his in a telling way.

As we mentioned awahile ago, the favorite food that the mountain lion gets in the wild is deer, and its favorite diet among domestic animals is young colts. But these are not the only kinds of animals on which the big cats prey. They are among the most destructive of the killer of the wilds. When venison, or mountain sheep, is not to be had, they readily turn their attention to horses, cattle, and domestic sheep; not only young colts but full grown horses and cows are killed and dragged away. What is not eaten immediately is often partly covered with litter, to be returned to and eaten later.

But these big, powerful cats we call mountain lions are not the only predatory wildcats. Others also cause so much damage, it often becomes necessary to kill some of them off to give other kinds of wild life and domestic livestock a chance.

For instance, there is the mountain lion's smaller cousin, the bobcat. It is much smaller and has somewhat different habits. A bobcat can't keep up a long fast flight like that of the mountain lion, but for short distances he can show considerable speed. You can distinguish its bobbing motion for some distance as it goes bounding away almost like a rabbit.

Mr. Young says that a bobcat is really timid, but like other cats, when forced to fight, it can give a good account of itself. However, a bobcat is lightly built and hasn't much strength and a good dog of its own size can kill it. One big dog or two or three smaller dogs can dispatch one of these wild cats without much trouble.

But don't get the idea that a bobcat isn't a dangerous killer. On its wild ranges, the bobcat feeds largely on rabbits and other small rodents such as wood rats, and kangaroo rats, and pocket gophers, ground squirrels, chipmunks, and a great variety of mice, It also takes a number of game birds, as many as it can catch. Often it kills the young, sometimes even the adults- of such larger animals as deer, and mountain sheep, and antelope.

But in many places, the bobcats don't confine themselves to killing wild life. They prey on poultry and pigs and calves and sheep. In fact, Mr. Young says they often do their worst damage among sheep at laming time, especially on the open range where lambing grounds are often near broken, rocky canyons or rimrock that just suits the bobcats for hide-outs. Sheepmen often choose such rugged country for lambing grounds because it affords protection against storms.

The bobcat sneaks into a flock of sheep under cover of darkness and goes about his killing in a way that causes little commotion. It kills the lamb with a bite on the back of the neck or head, and then pulls it down to eat it. The worst of it is that the bobcat often doesn't confine itself to merely killing for food. It often kills for the mere lust of killing. If that lust is not satisfied with one lamb the predator keeps quietly at work. Mr. Young says a single bobcat has been known to kill 38 lambs that way in one night.

But the wild cats are not the only animals that prey on sheep at lambing time. Our wild dogs, the wolves and the coyotes, are responsible for such heavy losses that controlling them also often becomes a matter of stern necessity.

Mr. Young says that people used to think that coyotes, for instance, only attacked domestic stock when there was a shortage of such natural food as rabbits. But recent evidence of attacks on flocks, seems to indicate that the coyote's appetite for sheep is just too strong. They just can't resist a fat lamb, no matter how much game or other meat may be readily available.

The damage to flocks is especially serious because whelping for the coyotes comes at the same time as lambing for the sheep. The old coyotes then kill and eat lambs for the pups at home in their dens as well as for themselves.

There are other interesting things you would like to hear about these wild animals we call predators. Perhaps we can strike the trail again some time with the Biological Survey's workers, but this ends today's excursion. If you need to know more about the country's wild animals, send your questions to the Biological Survey of the United States Department of Agriculture or to your local radio station.

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ANNOUNCEMENT: The discussion of the dogs and cats of the wilds to which you have just listened has come to you from the United States Department of Agriculture. Two weeks from today, Station _____ will present another of these visits with Uncle Sam's Naturalists.

UNITED STATES DEPARTMENT OF AGRICULTURE
Radio Service
OFFICE OF INFORMATION

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WITH UNCLE SAM'S NATURALISTS Friday, July 1, 1932

FOR BROADCAST USE ONLY

ANNOUNCEMENT: Now for a visit with some of Uncle Sam's Naturalists of the United States Department of Agriculture. This time we have some of nature's lore from the big tree men of the United States Forest Service.

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We have a lofty subject for you today.

The foresters have told us a little something about trees — big trees, redwoods that tower head and shoulders above their fellows of the forest. --- Even if you have never stood in a grove of those trees, and felt yourself dwarfed in the presence of the massive trunks majesticly soaring skyward, you have seen pictures of them.

However, it is not their impressive size or epic beauty that we want to talk about. Rather it is the way they grow, not individually, but as a forest. The specialists of the United States Forest Service have had occasion to study them to learn how nature grows timber. They make similar investigations in other sections with other kinds of trees. But we will talk about those other investigations some other time.

I've always heard our virgin redwood forest spoken of as being thousands of years old. That seems to be the common impression. Yet Uncle Sam's foresters tell me nothing is further from the fact. The redwood forest is many aged.

For example, here is the wide range of ages found on one typical 30-acre plot of redwoods. Without counting young sprouts and saplings less than 200 years old, there were 108 trees from 200 to 300 years old, 89 from 300 to 400 years old, 81 from 400 to 500 years old, 102 between 500 and 600 years old, and 67 from 600 to 700 years old. You see those young giants lacked considerable of being the same age.

But that is not all those trees, the wide range of ages runs on up. There were 38 redwoods in that 30 acre plot that were between 700 and 800 years old. Nearly as many more, or 34, were 800 to 900 years old, while there were 31 trees found to be 900 to 1,000 years old. There were just 17 more than 1,000 years old.

In other words, that patch of redwoods is a good example of nature's way of growing timber; so as to have a new crop of trees coming on

all the time. Instead of growing the crop of trees all the same age, then harvesting that crop all at once, then waiting a long time until another crop is produced, Nature keeps the woods in continuous production.

The forestry experts say that progressive lumbermen follow the system of selection used by Nature in the virgin redwood forest. That same system applies in growing other trees beside redwoods.

As you know, we have been largely brought up on the idea of the pioneer with his ax clearing the forest to make way for agriculture on the cleared land.

In these latter days, however, we've found that doesn't always work so well. Not only has the clearing been carried so far that we have begun to worry where the future supply of lumber is coming from, but we have also found that some lands grow timber better than anything else. We have come to look on timber as a crop. But trees don't mature in a single season, like our annual crops such as corn or wheat. We can't cut off all the trees and then plant seed and have another crop ready for harvest next season. It takes time to grow a tree.

However, as our foresters have pointed out, in the virgin forest all the trees are not of an even age. There are many different ages represented. By following the forest's own system and selecting the trees as they mature and leaving groups of trees to restock the ground, they say, we can keep the woods in practically continuous production.

However, these giant redwoods may take hundreds of years to reach the full majesty of their complete growth. The forest experts say that the old giants of the redwood forest are beautiful to behold but unprofitable to grow. They would have certain forests kept in continuous production according to Nature's method of selection, but for practical lumber production they would cut the new trees when still very young for redwoods.

The redwood tree takes a long, long time to attain its tremendous growth, yet it is fast growing. The yield of fully stocked redwood forests exceeds anything known among other American conifers even surpassing the Doublas fir of the Northwest. On the best sites, the foresters say, the average redwood at 50 years is 8 inches in diameter and 51 feet high, and on good sites the average redwood is 9 inches in diameter and 53 feet high. At that rate of growth, they figure that within fifty years a satisfactory merchantable forest of redwoods can be produced. The wood though consisting largely of common lumber and railroad ties, will be comparable in quality to similar grades from old-growth timber. When we talk about redwood forests we usually think of a forest made up altogether of redwoods. But the virgin redwood forest generally includes a considerable mixture of other trees. Redwood is rarely found in pure stands except on those partially stocked cut-over lands where powerful logging machinery and repeated fires have destroyed all the seed trees of other trees. With redwoods in the virgin forest are found Douglas firs, low-land firs, Sitka spruces, and western hemlock and such hardwoods as tanbark oak, and California laurel and red alder.

Our forest experts say that it is important that the redwoods do usually grow in association with other trees. Such mixtures often serve

as Nature's insurance against disaster to the whole forest. Many forest insects and diseases attack some species and not others. When such diseases get into a stand made up altogether of one susceptible species they do much more damage than in a natural mixed forest of several different kinds of trees. In Germany some years back pure stands of spruce were created by planting spruce on cut-over lands formerly occupied by mixed forests, but disaster followed. So unsuccessful have been the experiences with such artificial forests, that United States Forest Service specialists have urged that we follow nature's methods more closely. In reforesting land, instead of planting all the land to redwoods, for instance, to make a pure stand of redwood, they suggest that a high percentage of Douglas fir, and lowland fir, and spruce may well be retained.

Redwood bears plenty of seed, but seedling reproduction, the foresters find, takes place only under a very narrow range of conditions. Most of the new growth of redwoods on cut-over lands comes from redwood sprouts from the stumps. Scattered clumps of redwood sprouts reclaim the land. But unaided those redwood sprouts will yield something less than a third of the possible timber harvest. However, instead of filling in the gaps with planted redwood, as has been done in a number of cases, the foresters suggest seed trees of Douglas fir and other valuable species to make the full stand.

From what they say, I gather that it is well to follow Nature's methods in growing and harvesting timber crops.

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ANNOUNCEMENT: We will again hear from Uncle Sam's Naturalists two weeks from today. These talks come to you through the cooperation of Station _____ and the United States Department of Agriculture.

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WITH UNCLE SAM'S NATURALISTS

Friday, July 15, 1932.

NOT FOR PUBLICATION

Speaking Time: 10 Minutes.

ANNOUNCEMENT: And now for another visit with Uncle Sam's Naturalists of the United States Department of Agriculture. As usual, your Wildsman calls our attention to some of the facts about wild life as he picks them up from Department specialists.--

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Again we hear reports from some sections of the country, that the grasshopper has become a burden in the land.

But I'm not going to talk about that all-devouring host of grasshoppers. I just mention it in passing, by way of illustration of the importance of some other things, particularly our much maligned friend, the skunk.

Such serious scourges caused by tremendous multiplication of this or that pest might happen oftener but for the forces of nature which tend to keep such things in control. Of course, the weather is generally the big factor in the case of grasshoppers, but there are a number of other forces. Our old friend, the much-despised skunk, is one of them.

A lot of people have always held skunks in bad odor, but skunks do yeoman service in destroying grasshoppers. Specialists of the Bureau of Biological Survey, who have inside information on the subject, tell me that in July, August, and September, when grasshoppers are most abundant, they form the chief food of skumks. In fact, during some of the previous invasions of our plains country by grasshoppers the skunk was credited with being the principal mammal destroying those insects.

But grasshoppers are not the only damaging crop insect on the skunk's bill-of fare. The skunk is also the best-known mammal enemy of army worm, the common army worm, the wheat-head army worm, and the fall army worm, which are so destructive to small grains, and corn, and grasses.

Skunks are fond, too, of the insects known as tobacco worms which do so much damage to tobacco and tomato plants. In fact, they eat a great number of insects and mostly the kinds that are highly damaging to plant life, such as cutworms, cicadas, crickets, and beetles injurious to sweet potatoes in the South.

They also seem to consider the Colorado potato beetle a delicate morsel and spend many a busy evening in potato patches catching and eating the grubs and mature beetles.

However, insects are not the sold food of skunks, by any manner of means. These beautiful little black and white "polecats", as we used to call them, have been accused of killing quail and other game birds and of taking chickens and eggs. And they do sometimes, but more often they get blamed for some other animal's depredations. As a matter of fact, I've known quails to nest and hatch out a brood within a few rods of a skunk den. The truth seems to be that at the season when our native game birds are nesting, skunks have plenty of insect food. By the time that insect food fails, the birds are strong of wing and seldom fall a prey to a polecat.

As for the chickens, the skunk gets credit for a lot of killings by weasels and minks, which are much better climbers and far more bloodthirsty. Likely as not, the skunk detected around the hen house was there after the rats and mice. Polecats are really remarkably fine mousers. Of course, the individual that hunts and kills chickens should be destroyed.

Most such suspicion, the specialists tell me comes from the fact that skunks work largely under cover of darkness and the person who sweepingly blames the skunk usually doesn't go to the trouble of investigating thoroughly. Evidence taken from the stomachs of a large number of skunks supports the idea that skunks are on the whole highly beneficial in their food habits.

And of course we all know that skunk skins are highly prized for fur. Nowadays we just have three fairly abundant fur animals left in the United States; the muskrat, the mink, and the skunk. The biologists say that there seems to be little danger of extinction of the muskrat, but that the mink is already in danger, and that the demand for skunk fur is causing more and more trapping of skunks.

However, as far as the fur question goes some of our specialists believe that skunks can be domesticated and successfully raised in captivity in many parts of the United States.

And while we are mentioning misunderstood wild creatures, let me say a good word for the European Starlings, now found as breeding birds in many of the States east of the Mississippi River. In the last twenty years, they have spread fast, and there seems every reason to expect that they will continue to spread westward to the Rocky Mountains, and if the Mountains don't stop them, right on to the Pacific Coast.

A lot of farmers and bird lovers have looked with suspicion on the ever-increasing flocks of these birds and have accused them of many crimes. And specialists of the Biological Survey admit that Starlings do damage cherries, and other small fruits, and garden truck, and even late fruit and corn. And probably their filth-producing roosting habits in cities are more largely responsible for the bad name they have acquired.

Weighing starling's good habits against their bad ones, however, our scientists credit starlings with doing much more good than harm. They are insect eating birds, and observations of them in the field has established the fact that the time spent by starlings in destroying crops or in molesting other birds is short compared to the endless hours they spend searching for insects or feeding on wild fruit.

Starlings help destroy such pests as the clover-leaf weevil, the Japanese beetle, May beetles, cutworms, and yes, grasshoppers too. As insect destroyers starlings are more energetic than some of our protected native birds.

Now let's turn to a different subject and observe another phase of wild life and life in the wild.

Mr. Earl W. Tinker, regional forester of the United States Forest Service, has been telling me some of the unusual problems in fire protection in the Superior National Forest in Minnesota.

As you know, one of the problems of fighting fire anywhere is getting the fire fighters to the fire and getting them there promptly.

In most of our forests, there are a network of roads and trails designed to permit fast travel. But in the Superior National Forest we have some 1,000 square miles set aside as a primitive area, where there are no roads, and practically no trails. It is a wild country, with little human habitation, but plenty of game such as moose, and deer, and wolves, and other fur animals. And what's more it is interlaced with a labyrinth of waterways, lakes, and great areas of spruce and muskeg swamp.

Mr. Tinker says it is practically impassable to foot travel in summer. The cruising of timber and other activities of the Forest Service are done in winter when the lakes and swamps and streams are frozen and dog teams can be used for transportation. The usual way to get around in summer is by canoe and portage -- and that is slow work -- too slow for men going to a fire. One and one-half miles an hour is considered high speed in that region.

To meet that situation, the Forest Service plans to improve the portages and on the chief travel routes to install light tracks over which fire equipment can be moved faster. They also plan to improve the water routes by installing dams to do away with slow portage work. Hydroplanes have proved a great success in rapid transportation of small fire-fighting crews. By the use of planes, small crews have been carried to the scene of a forest fire in the Superior National Forest in 30 minutes where previously it took a day and half.

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ANNOUNCEMENT: We will have another visit with Uncle Sam's Naturalists two weeks from today. Station _____ presents these talks every other week. They are prepared by the United States Department of Agriculture.

UNITED STATES DEPARTMENT OF AGRICULTURE
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WITH UNCLE SAM'S NATURALISTS. Friday, July 29, 1932

ANNOUNCEMENT: Station _____ now gives the results of a visit with Uncle Sam's Naturalists of the United States Department of Agriculture. This time it is with a bird specialist who tells us a few things about the American eagle.

Some folks seem to think that the only eagles left are those that fly across our quarters and other small coins and roost on our gold pieces. But there are still some of them in the wild right around our National Capital. Dr. H. C. Oberholser says he can't see that there has been any big decrease in them in most places. There are still thousands of eagles in all along our coasts. And Dr. Oberholser knows his eagles. He is one of the leading bird investigators of the Bureau of Biological Survey.

American bald eagles are found pretty generally all over North America. As a rule, however, they are most common near the coast. That is, within about a hundred miles of the coast and up the big rivers and near the Great Lakes. There are some American eagles also in the Mississippi Valley. Many of them still live along our Atlantic Coast. There are more yet on the Pacific side. They are most plentiful in Alaska and Florida. Climate doesn't make much difference to a bald eagle, but he does like fish. Old Baldy wouldn't care if every day were Friday.

That fondness for fish, Dr. Oberholser tells me has caused these national birds to be very unpopular with salmon canners in Alaska. The eagles sometimes beat the fishermen to the fish. Most of the salmon they eat, however, are those that die upstream after spawning. Yes, our proud old bird of prey is sometimes quite a scavenger.

In fact, ever since Benjamin Franklin first tried to have the wild turkey made our national bird instead of the eagle, there have been a lot of hard things said about the feeding habits of American eagles. But the bald eagles are not so bad as they are sometimes painted.

Dr. Oberholser says that on the whole eagles do more good than they do harm. The fact that they are sometimes scavengers should not be held against them. That they are very useful to man in this way is really a point in their favor.

But the American bald eagle seems to prefer his food fresh. This bird of prey is the wild son of the wilds. He must get his living by beak and talons, as others of his kind do. He generally goes after it himself. However, he is not above acting as an aerial hi-jacker. He often lets the Osprey catch fish and then swoops down on the Osprey and forces him to let go his catch.

Old Baldy even works a similar game with human duck hunters. When the gunner brings down a duck, the eagle may drop like a bolt from the blue and carry it off before the sportsman can get to it.

But the bald eagle doesn't have to have help in getting his ducks, usually catching them when they have dived to escape. The eagle waits until the duck comes up, then swoops again. He keeps that up, until the duck, tired out, falls an easy prey.

Besides having speed as a flyer, Dr. Oberholser says that the eagle can soar as well as the turkey buzzard. There is hardly any greater compliment on soaring ability than that.

In addition, this charter member of our air service is remarkable at zooming. He can shoot down from far aloft so fast that you can hardly see him.

When he comes up again he may be lifting considerable weight. An American eagle has been known to carry a lamb weighing almost as much as itself as far as five miles.

Yes, he does sometimes attack domestic livestock, usually lambs or young pigs. But his chief food is fish. Upland game birds are seldom bothered. He doesn't trouble song birds. He does kill squirrels, rabbits, and rats. He has been known to attack human beings.

That's very seldom. He rarely does it unless provoked to it. Dr. Oberholser points out that when not molested, our American eagle is surprisingly tame and unsuspicious. When it comes to the matter of defending the nest, however, he shows considerable courage.

That nest is quite a remarkable home, and the bald eagle is considerable of a home-body. When eagles mate, they apparently mate for life. They usually build their nest high in the top of a tall tree. If no suitable tree is handy, they ordinarily build on a high cliff or bluff.

The nest is usually a wonderfully strong, substantial structure wherever they build it, and it is quite sizable. About five feet across, and maybe six feet deep, and so strong that a man can walk on it without breaking through. Sticks two or three inches thick are used. Such a huge nest high in the top of the tallest pine may often be seen for miles.

Both parent birds take shifts in hatching the eggs and taking care of the young. There were equal rights in the eagle's aerie long before the 19th Amendment.

The families in these sky-scraper apartments are usually small. There are generally two, sometimes three, eggs. The eaglets stay in the nest for three or four months after they are hatched. When young they don't have those white feathers on the head which give that bald appearance. The older birds are the bald ones.

Old Baldy, or Old Glory, or whatever you call this typical American, has no competitor in the air and no enemies, except man.

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ANNOUNCEMENT: Our Wildsman has just been telling us about the American Bald Eagle in his native haunts. This is one of our bi-weekly series with Uncle Sam's Naturalists. This feature is presented by Station_____in cooperation with the United States Department of Agriculture.

UNITED STATES DEPARTMENT OF AGRICULTURE — Radio Service — OFFICE OF INFORMATION

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WITH UNCLE SAM'S NATURALISTS Friday, August 12, 1932

FOR BROADCAST USE ONLY

Speaking Time: 10 Minutes.

ANNOUNCEMENT: Again we visit with Uncle Sam's Naturalists of the United States Department of Agriculture. This time we talk with one of them about the hidden facts in the lives of one of the notorious animal characters of the underworld on our western States,--the pocket gopher.

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Mr. Vernon Bailey, Chief field naturalist of the United States Biological Survey, tells me that most people who live in pocket-gopher country have never seen a pocket gopher alive in its normal dress.

This is not surprising, when you consider that pocket gophers spend almost their entire lives underground. They are mining, burrowing little animals powerfully built to tunnel for food.

And they certainly are industrious miners and sappers, as farmers and irrigation engineers in pocket-gopher country will tell you, or show you. They leave plenty of evidence of their work. Of course, a good many people have seen wet and muddy pocket gophers forced out of their burrows by irrigation water. Pocket gophers in that condition are anything but attractive. Mr. Bailey says that the clean, smooth-furred, sturdy little miner in its normal dress is a very different looking animal.

Mr. Bailey had investigated the private habits of many different species and races of pocket gophers, varying in size from some as small as a big mouse to others as heavy as a big house rat.

He has "shot" pocket gophers with his camera as he has caught them coming to the door of their burrows to throw out loads of earth.

From what he says, the pocket gopher is a sort of animated wheelbarrow, without the wheel. Instead of its scratching or kicking out the earth, the pocket gopher brings each load of earth out under its chin and half encircled by its arms. It "wheel-barrows" itself along by pushing with its hind feet.

But the pocket gopher doesn't waste much time outside. It can't afford to. It has a host of enemies on the look out for it. The pocket gopher and its close relatives are a favorite food with hawks, and owls, and weasels, and foxes, and bobcats, and badgers, and even bears. Hawks and owls swoop down on the pocket gopher when it shows itself above ground. Foxes and bobcats will pounce on one when it throws out the earth. And when weasles can catch the doorway open, they go right into the burrow and capture the little miner.

Mr. Bailey says that the motions of the pocket gophers he has observed are so quick that only a snapshot can catch them distinctly.

As we said before, there are different species of pocket gophers. The Colorado pocket gopher, for instance, has the highest range in the mountains.

Mr. Bailey has found the upper slopes of mountains literally plowed over by Colorado pocket gophers. The pocket-gopher burrows seem to honeycomb the ground in some places. The mounds of earth thrown out of the tunnels dot the surface so thickly that they often cover from a tenth to a fifth of the surface. As fresh hills are thrown up, the old ones gradually sink and disappear beneath a rich carpet of vegetation.

In that way, the pocket gophers constantly plow the ground and bury the vegetation beneath the surface. Mr. Bailey says that the turn-over increases the fertility of the mountain slopes in many places. Not only that, but the network of burrows underneath the surface helps hold and carry the water into the soil and store it for use. Of course, the Colorado pocket gophers uproot, and cover, and eat a great deal of the mountain vegetation, but it all returns to the soil with a distinct gain in fertility. The work of these high mountain pocket gophers, our naturalist estimates, is mainly beneficial.

But all pocket gophers don't live on the uper slopes. Some live on the plateaus, others along the valley bottoms, and still other kinds live in the desert.

Now a desert is about the last place you might think of any animal flourishing. Yet Mr. Bailey says the desert pocket gophers seem to live very comfortably there -- as much so as those in apparently more favored places.

Pocket gophers go where they can find food. You might think the cactuses and other desert plants protected by hooks and spines would offer little encouragement to even a hungry gopher. But you must remember, pocket gophers are miners and sappers. They attack those armed desert plants from underground. They burrow into a cactus from beneath, and eat out the tender inside. Then they tunnel their way along to the roots of the next plant.

And, by the way, the pocket gopher doesn't get its name from its size, whether that be vest-pocket or coat pocket size. The pocket in the pocket gopher's name refers to the pouches in the cheeks, which make very useful receptacles in which those little miners carry the food they take back to the nest.

Pocket gophers that live in or under the desert or high up the slopes of mountains where there are no ranches or settlements may be just interesting little representatives of life in the wilds. But the pocket gophers that live in the moist fertile valleys where there are farms, with fields, and orchards, and gardens, do serious damage to farm crops and irrigation ditches.

From what Mr. Bailey says, it would seem that farmers have spread feasts of domestic plants that these destructive rodents prefer to the wild plants of their range. For instance, the big golden pocket gophers and the chestnut pocket gophers are especially partial to alfalfa.

In alfalfa fields and meadows, pocket gophers eat the stems and roots, while their earth mounds do added damage by covering and destroying part of the crop. Not only that, but in their industrious tunneling for food, these gophers often prevent irrigation farmers from getting enough water on the alfalfa to make a full crop. The underground tunnels carry the water off in streams and waste what is needed for the crop.

Pocket gophers and other rodents take up their residence in the banks of irrigation ditches, and their burrows cause expensive breaks in these ditches. The gophers also fill up a great part of some of the small local ditches by throwing the earth out from their burrows, in the ditch banks.

In places they also do considerable damage in orchards, and gardens, and potato fields by eating the roots, and tubers, and other underground parts of trees and plants. In some orchards, the trees lean one way or the other, because the pocket gophers have cut off part of the roots.

Mr. Bailey says it is especially important to be able to control the abundance of pocket gophers on irrigated farms. Gopher mounds are also very troublesome to the farmer in mowing. If the sickle is lowered to get a full cut, it is sure to run through heaps of sand and gravel thrown out by gophers. That, of course, dulls the mowing blade.

However, Mr. Bailey points out that pocket gophers may be kept under control and that there is little excuse for leaving them in the fields in any locality where they can do damage. And they can do considerable damage, and don't forget that. The United States Biological Survey, however, helps farmers by giving directions for controlling pocket gophers in special cases that are not easily handled.

The results of pocket-gopher depredations are only too evident. But their habits underground are still largely unknown. Mr. Bailey says there is much to be learned of their hidden lives. And, now to conclude our little tale of the pocket gopher with a word about the short tail of the pocket gopher itself. Mr. Bailey says the pocket gopher's tail is useful mainly as an organ of touch. It helps guide the little miner backward through its tunnel.

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ANNOUNCEMENT: You have just listened to a short tale of the pocket gopher, as relayed to you from Mr. Vernon Bailey, chief field naturalist of the United States Biological Survey. We will have another visit with Uncle Sam's Naturalists two weeks from today.

UNITED STATES DEPARTMENT OF AGRICULTURE

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WITH UNCLE SAM'S NATURALISTS. Friday, August 26, 1932

RECEIVED AUG 26 1932 U.S. Department of Agriculture

FOR BROADCAST USE ONLY

Speaking Time 10 Minutes.

ANNOUNCEMENT: And now for a talk with Uncle Sam's Naturalists of the United States Department of Agriculture. Today Station _____ presents a little inside information about hawks and owls, those birds of prey accused by some folks of being nothing but bird bandits.

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Let's be fair about hawks and owls ----

---- Just a moment -- I know this is an unpopular subject with some of my friends -- They have no patience with anything that looks like a hawk or an owl!

I know some of them feel they have reason to hate hawks and owls. I can sympathize with their viewpoint. But before we go ahead and bitterly condemn all hawks and owls for what we think some of them do, let's get a little more closely acquainted with our hawks and owls.

I have a particular friend who is ready to take the stand at any time as a witness against any and every hawk. And he feels much the same way about owls.

My friend lives on a farm, and he will tell you that hawks and owls rob him of some of his best young chickens. He is a sportsman and likes to hunt game birds. He charges that owls not only kill his chicks but also the quail on his place, under cover of darkness.

Suggest to that farmer that he may be mistaken in the identity of the killer. He will tell you he has seen a hawk swoop down and seize one of his helpless chicks in its talons. He can describe just how the hawk does it. He has seen it not once, but a number of times. That evidence of an eye-witness is very convincing. There is no question but that he has lost chickens from hawks. His evidence is certainly damaging to the hawk.

But ask him what kind of hawk it was! Then he begins to try to dodge the issue. To him, a hawk is a hawk. He doesn't see that it makes any difference what kind it was. He doesn't know, and doesn't care. But, from what Mr. W. L. McAtee of the United States Biological Survey says, that is a mighty important point. There is no use blaming all hawks, and making war on all hawks and all owls, because some hawks and some owls may be bandits, as far as we are concerned.

When my friend sees a hawk beating back and forth over a harvest field or meadow, or glimpses an owl flying silently over his orchard, he gets mad clear through. He never stops to inquire whether that is the same kind of hawk or same kind of owl that pounced on his chickens. Some of those hawks my friend has seen tirelessly beating back and forth over his harvest fields were probably working for him and not against him. They help keep down the insect and rodent enemies of his crops. Some hawks destroy game birds and poultry. But not even all of those deserve the bad name they have been given.

Mr. McAtee says that most hawks and owls are actually more beneficial than injurious. Even some of those that do take chickens, more than make up for their barn-yard raids, by steady work in the fields clearing out some of our crop enemies.

As Mr. McAtee explains it, this question of whether or not we class a bird as good or bad depends largely on what the bird eats. Mr. McAtee and other scientists of the United States Biological Survey have inside information on this subject. They base their conclusions on analyses of the food found in the stomachs of hundreds of birds, as well as long observation of the live birds in the field and woods. They know their subjects inside and out.

Mr. McAtee tells us that birds of prey, such as hawks and owls, are big eaters. Every day they eat a great quantity of food compared to their own body weight. The hawks hunt by day and keep the day-time mammals in check. An owl's eyesight is keenest during twilight and before dawn. The owls capture many of the crop pests that roam around at night. Owls are less migratory than hawks and during the winter they wage incessant warfare against the enemies of orchards, and gardens, and harvest field.

But don't misunderstand me, Mr. McAtee doesn't claim that all owls are more helpful than otherwise. For instance, he admits that the great horned owl does like a chicken dinner, and is not at all backward about taking it.

However, he reminds us that the great horned owls, like most of its relatives, feeds at night. He can only capture the chickens that are not properly protected. If you prevent the great horned owl from getting at the chickens, Mr. McAtee would also class the horned owl as largely beneficial rather than injurious.

Among the hawks, Mr. McAtee finds the sharp-shinned hawk, Cooper's hawk, duck hawk, and the goshawk correctly regarded as chiefly injurious from our viewpoint. Those are the hawks that feed so largely on birds, on game birds and domesticated birds, such as chickens.

Mr. McAtee points out that you can tell the bad hawks from the good by the way they fly. The bad bird hawks fly swiftly over trees and bushes and make sudden darts upon their prey. From the way they pounce on their prey and on account of their color, three kinds of bird hawks are often known as blue darters.

Hawks that are chiefly beneficial fly differently from those darting hawks. The good hawks either soar at considerable height or hover over places where they are hunting their prey. They prey largely on meadow mice, but their bill-of-fare includes a lot of other destructive pests such as rabbits, ground squirrels, prairie dogs, pocket gophers, and house rats and mice.

Mr. McAtee says the two of our best known hawks, the red-tailed hawk and the red-shouldered hawk, often called "hen hawks" are valuable to farmers.

I told my friend that, and he insisted that he had seen a hawk of that very tribe carry off one of his chicks. Well, Mr. McAtee admits that both those hawks sometimes eat poultry. But the inside information is that the damage red-tailed and red-shouldered hawks do that way is small compared to the good they do.

The red-shouldered so-called "hen hawk" feeds on mice, birds, snakes, fish, grasshoppers, centipedes, spiders, crawfish, earthworms, and snails. About 90 per cent of the misnamed "hen-hawk's" food is made up of injurious animals and insects. Hardly 1 1/2 per cent of its food is poultry and game birds. The handsome little sparrow hawk at times attacks small birds and young chickens, but Mr. McAtee says that grasshoppers, and crickets, and other insects form its chief articles of diet during warm weather, and during the rest of the year the sparrow hawk preys mostly on meadow mice and house mice.

We could go on through the list of hawks and owls giving the more or less valuable food habits of each of them. Mr. McAtee says that services of the barn owl are typical of those of the hawks and owls in general. A barn owl probably eats about three small mammals at a meal and dines often. Those in the East have been found to feed mostly on meadow mice, house mice, and house rats. In California, they eat pocket gophers, field mice, pocket mice, deer mice, harvest mice, kangaroo rats, and house mice.

Owls have long been persecuted by man, but Mr. McAtee declares that never has persecution been more unjust. He points out that the hawks and owls are not the only sufferers. When the hawks and owls are greatly reduced, farmers find themselves faced with a great increase in the number of destructive rodents.

ANNOUNCEMENT: You have just listened to a discussion of the value of hawks and owls. Station _____ presents these results of interviews with Uncle Sam's Naturalists of the United States Department of Agriculture every two weeks.

UNITED STATES DEPARTMENT OF AGRICULTURE

Radio Service

OFFICE OF INFORMATION

WITH UNCLE SAM'S NATURALISTS Friday, September 9, 1932

FOR BROADCAST USE ONLY

Speaking Time: 10 Minutes.

ANNOUNCEMENT: And now for another visit with Uncle Sam's Naturalists, of the United States Department of Agriculture. Today we go into the wilds again. This time our naturalist tells us a little about some of those highly interesting inhabitants of the wilds, our native American rats and mice.

* * * * * *

The moment anybody mentions rats and mice, most of us think about those filthy, thieving scavengers, the brown wharf rats, and those damaging nuisances, the house mice.

Yet those ubiquitous brown rats and house mice of our towns and cities are not American rats and mice at all.

Those common rats and mice that cause such an enormous loss by destroying grain and food and other stores, and by causing fires, and by spreading disease are old world rats and mice. They came over from Europe in colonial days. In fact, naturalists tell us, the common brown rat was unknown in this country until about 1775. The brown rat first invaded our wharfs during the American Revolution.

Some of you householders may sigh for the good old days before that time--But wait a minute ----

Mr. Vernon Bailey, of the United States Biological Survey, has found evidence that the pre-historic cliff-dwellers of northwestern New Mexico, southeastern Utah, and northeastern Arizona, had their rat-troubles too.

Camping in the ruins of the ancient Pueblo Bonito in Chaco Canyon, Mr. Bailey has been over-run by bushy-tailed wood rats. He has discovered traces that lead him to think that those native American rats were probably serious pests to the food-storing Indians who lived there long before Columbus discovered America.

Those bushy-tailed wood rats are just one kind of native American rats. As many of you campers know, there are a number of kinds of American rats and mice. You find different kinds in the cliffs, high up the slopes of the mountain forests, along the cool streams, in the valleys, out on the wide prairies, even in the desert.

But get this. Mr. Bailey says our American rats are very different from our common house rats the brown, black or roof rats. American wood rats look more like Old World rats, than they act like them. In fact, wood rats are cleanly animals, and lead clean, wholesome lives. With many tribes of Indians, wood rats are popular game animals, and Mr. Bailey, who has tasted most of the different kinds, says they are very good eating, tender and first-rate flavor. He points

out that the Colorado wood rats, one of the favorite foods of the Navajo Indians, are plentiful in the country where some of the early explorers starved to death. Those explorers might have crossed through the wilderness in safety, if they had realized how easily they could have supplied themselves with plenty of such delicate, delicious small game.

All our wood rats seem to have a passion for building houses out of almost anything they can carry off. They have been called "pack rats" and "trade rats" and many wild stories have been told about their habits of borrowing and returning things. However, the real facts are more fascinating than the fictions.

Take the hoary wood rats for instance. Hoary wood rats live in the open arid valleys where cactus and other thorny desert shrubs grow. They build thorny walled houses in the midst of beds of big prickley-pears of thorny bushes, or in groups of Spanish bayonets or in allthorn.

That sounds like a pretty good defense doesn't it? A house of thorns certainly doesn't sound inviting to intruders. But you might think that life among thorns would not be all roses for the hoary wood rats themselves. However, Mr. Bailey tells me he has seen one of these hoary wood rats, as bright and pretty as a squirrel or a chipmunk, climb over a mass of thorns and apparently never get the slightest scratch on its delicate pink feet.

The cactus is the hoary wood rat's food and drink, It eats both the flesh and the fruit of the cactus, besides a great variety of green vegetation, and fruits, and seeds. He lives on wide stretches of desert, where there is no water to be had for months at a time, except what water is contained in the desert food plants.

If cactus growing ever becomes an important industry, both the hoary wood rat and the white-throated wood rat, may become serious enemies to the business. Some years, much of the desert vegetation is killed by them. As it is, Mr. Bailey explains, although they may do some local damage on the edges of irrigated fields and gardens, these wood rats are in the main harmless, interesting features of the desert.

We can't tell you all the interesting things Mr. Bailey told about the different American rats. The important thing to remember is that there are rats and rats, and you can't judge the cleanly, delicious tasting American wood rats by the altogether bad species of Old World animals to which we happen to have first applied the same general name.

The same thing can be said of mice. We can't judge all the many native American mice by those damaging little European house mice that give us so much trouble.

Don't mistake me. Some of our native American mice give us plenty of trouble too. Others we can class as neutral: that is, the harm they do is just about balanced by their good habits, or they just spend their lives where they are not in conflict with our interests. And we have still other mice that may be classed as downright beneficial.

Mr. Bailey has suggested that our grasshopper or scorpion or calling mice might well be used as pets for the children.

Scorpion mice eat other insects besides scorpions. They eat grasshoppers, crickets, beetles, caterpillars, cutworms, and insect eggs. They would thus be useful in keeping down insect pests in greenhouses, and gardens. They would also often capture and devour other species of mice.

These friendly mice get their names of grasshopper mice and scorpion mice from their feeding habits. They are called calling mice on account of their unusual voices. From what Mr. Bailey tells me, this little animal throws up its head, opens its mouth, closes its eyes and howls like a lone wolf on the snow-covered crest of a far ridge. Only the "howl" of the calling mouse is so thin and high, a person has to have keen ears to detect the sound. But, allowing for the difference in size of the wolf and the mouse, Mr. Bailey says the calls are not so different.

Another mouse Mr. Bailey classes among the good mice is the little Arizona grasshopper mouse. He has made a close study of the food and general habits of Arizona and grasshopper mice and finds them mainly if not entirely useful animals. They have no possibilities of injurious effect on agriculture, and their influence in holding in check insects and other species of mice may be important.

On the other hand, several species of the more numerous little seed-eating deer mice that live in the forests are probably enemies to forest growth. They discover and confiscate many of the carefully secreted seed stores of squirrels and chipmunks, which might otherwise be left to grow. If it wasn't for their natural enemies such as owls, and weasels, and foxes, and wild cats, and badgers, and skunks, and snakes, the deer mice might do a lot more damage than they do.

Rocky Mountain meadow mice, and several other species of meadow mice, do some mischief in lessening the grass crop of the mountain meadows. They also destroy some small trees that otherwise might help reforest some of the mountain slopes, but they have plenty of enemies waiting for them too.

Those Rocky Mountain meadow mice are great road builders. Their roads leading from one burrow to another are not merely paths worn smooth by the repeated passing of feet. They are deliberately made roads. The mice will cut away the growing vegetation and lift the old fallen mat of vegetation high enough to make tunnels between it and the smooth surface of the ground. Where there is plenty of both fresh and dry vegetation, those runways are well concealed. But in many places they are conspicuous from above as one looks closely down into the short grass. And, we might add, nature has many other half hidden facts of interest for those of us who look for them.

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ANNOUNCEMENT: You have just heard a short sketch of some of our many American rats and mice. This time two weeks from today, we will have another of these little visits with Uncel Sam's Naturalists of the United States Department of Agriculture.

UNITED STATES DEPARTMENT OF AGRICULTURE
Radio Service
OFFICE OF INFORMATION

WITH UNCLE SAM'S NATURALISTS

RELEASE Friday, Sept. 23, 1932

FOR BROADCAST USE ONLY

Speaking Time 10 Minutes.

ANNOUNCEMENT: Now let's again spend a few minutes with Uncle Sam's Naturalists of the United States Department of Agriculture. We will join them for a peep at some of the interesting rodents on the ranges of our Great Plains country.

---ooOoo---

We ride out on the range with Mr. Vernon Bailey, of the United States Biological Survey, who tells us a few things about kangaroo rate - beautiful little animals.

We will have to be careful where we ride. As any cow man will tell you, it is no pleasant matter riding over ground where many kangaroo rats have made mounds. Of course, some of the kangaroo rats make big mounds that are easy to see and avoid. But there is real danger if you ride over low mounds without seeing them. Where the burrows enter the ground without noticeable mounds, your horse may break through and drop a foot or two in the ground without warning, and that may not be any joke for either you or the horse if you are riding fast.

Those mounds honeycombed with passages are not only the homes built by the kangaroo rats, but also their storehouses where they sometimes store a bushel or more of seeds for future use. Kangaroo rats not only lay up stores for winter, but also provide food for long dry spells when little or nothing grows. All the kangaroo rats are dainty feeders. They shell out the seeds and eat only the clean inner kernels. They gather the seed from many small local plants, tuck the seed into their cheek pockets, and then return to their mounds or dens, to eat. One movement of the kangaroo rat's hands pressing forward on those elastic pockets on the outside of the lower jaws, and the pockets are emptied. What the kangaroo rat doesn't eat at the time it stores for future use.

On most of their range, the kangaroo rats don't come in contact with any farm crops. In some places, however, they do harvest grain and carry off a considerable amount of it, two teaspoons full at a time in those cheek pockets, each of which, in the bigger kinds, holds a little over a teaspoonful. But these little seed toters are fast workers and make many trips.

In ordinary years, Mr. Bailey figures, they probably do very little damage to the range, but in dry years when seeds of grasses and other forage plants are scarce they may take a good part of the available seed and leave very little for reproduction.

Seeds are not all they eat. When we come to a little rise in the ground, we find a lot of bare spots dotting the mesa. Those bare patches are where some of the largest and handsomest of our kangaroo rats, New Mexican banner-tails, have dug up some of the best range grasses by the roots. They also carry those grass roots off to their homes and storehouses.

In fact, kangaroo rats can do quite a bit of damage that way, and Mr. Bailey says that as plans for improving or keeping up the cattle carrying capacity of the range progress, we will probably have to cut down the number of kangaroo rats in some places. In moderate numbers they are harmless and interesting neighbors. In the day time, a surprised kangaroo rat may bob up where you can see him, but ordinarily you never see them by day. Kangaroo rats are night prowlers. They close up their burrows before daylight and don't open the doors again until after dark.

Mr. Bailey says that many a time he has opened up some of the doors in the daytime, and watched the kangaroo rats bring earth to the entrance and kick it back of them until they closed the doorway again. That shows they are alert, and not all to be caught napping in the daytime when you might expect them to be asleep.

They may well be on the alert, too. They have plenty of natural enemies ready to seize them night and day. Snakes, hawks, owls, foxes, coyotes, cats, and weasels hunt them, and they have to rely on quick sight and hearing and speed as their only defence outside the closed dens.

The prompt way the kangaroo rats have of closing their doors during the day, is not the only evidence that they are on the alert. Mr. Bailey will show you another way to tell. He will tap or scratch on the earth at the closed doorway, and if you will listen closely, you may hear a low drumming or thumping noise from inside the mound, something like the sound of the distant galloping of a horse. The kangaroo rats make that tapping sound or signal with their big hind feet.

All their enemies are not among other kinds of animals. Kangaroo rats also have their troubles from other kangaroo rats. For instance, the big Arizona banner-tail builds big mounds and lays up large stores, but a smaller kind of kangaroo rat does not store food. This little banner-tail burglar steals from the stores of his bigger relative. The Arizona kangaroo rat will pounce at the little fellow, but when he lands exactly on the spot where the little fellow was, that artful dodger is gone.

However, if the big banner-tail gets the little fellow cornered in close quarters, it is too bad for the little thief. In fact, even with their own particular kind, kangaroo rats are often vicious fighters.

Mr. Bailey describes a fight between two kangaroo rats. They faced each other, jumping high in the air, trying to strike each other straight down from above. At first, they both jumped at once and met in the air, and little damage was done. But as one got tired or scared or was knocked over so that the other got a fair stroke at it, the blows went home with deadly force. The old saying "he who fights and runs away may live to fight another day" doesn't seem to work among kangaroo rats. If one turns and runs, its fate is sealed.

Yet Mr. Bailey tells us that these kangaroo rats are very gentle with human beings. They almost never bite, and if held loosely in the hollow hands will soon cease struggling and can be as easily handled as any domestic animals.

Not only does Mr. Bailey tell us that, but he shows us. He has found kangaroo rats easy to trap and keep in captivity. That gives us a chance to get a close-up of them.

One look at those long powerful hind legs, and the little front feet or hands, and the way one of these animals can hop about on its hind feet like a robin, makes it easy to understand how it got the name of kangaroo rat.

The long tail may puzzle you, but it is very useful to the kangaroo rat. It is long, with a long crest near the tip. That crest is along the top and much higher than it is wide. It is a first-rate rudder to help guide the kangaroo rat as it leaps through the air or skims along with its hind feet just touching the ground now and then.

The kangaroo rat has several other striking features, including its owl-like eyes, which shine at night with a light-red glow; its wide head to accommodate the remarkable ear-phones supposed to magnify and clarify the sounds that come through the ground; and its oil gland on top of the shoulder which supplies the oil to keep the fur soft and waterproof.

Kangaroo rats are another group of American rodents that have very cleanly habits and are very unlike those filthy animals, the familiar wharf or house rats which slipped into this country from Europe, and which we generally associate with the name of rat.

On many parts of their range, Mr. Bailey holds that the best way to keep some kinds of kangaroo rats under control, is to protect their natural enemies such as the hawks, owls, foxes, and other animals that prey on them. On parts of their range where these neat, clean little rodents attack crops or damage irrigation ditches, or do serious damage to range grasses, however, it may be necessary for man to take a hand with more strenuous control measures. You see it is largely a matter of what these animals eat and where, whether we count them our enemies or friends.

ANNOUNCEMENT: Two weeks from today we will again visit with Uncle Sam's Naturalists of the United States Department of Agriculture. At that time, we will hear about some other phase of the wild life in the big outdoors.

UNITED STATES DEPARTMENT OF AGRICULTURE — Radio Service — OFFICE OF INFORMATION

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WITH UNCLE SAM'S NATURALISTS

RELEASE Friday, October 7,193?

FOR BROADCAST USE ONLY

Reading Time: 10 Minutes

ANNOUNCEMENT: We're now ready for another visit with Uncle Sam's Naturalists of the United States Department of Agriculture. Before we go into the woods and marshes to see how Uncle Sam is protecting our bird life, we'll turn back for a moment to one of the most fascinating stories in all wild life lore. This is the story of the passenger pigeon.

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I suppose some of the old-timers listening in today can remember the time when passenger pigeons flew over the eastern half of the United States by the millions and millions.

No doubt some of you saw the pigeons yourself. The rest of you can at least recall some of the amazing tales the old-timers tell about the pigeons.

For instance, the great naturalists, Audubon, describes a pigeon flight he saw in Kentucky near the Ohio River. He says, "The air was literally filled with pigeons; the light of noonday was obscured as by an eclipse. At once, like a torrent, and with a noise like thunder, they rushed into a compact mass, pressing each other towards the center." And then he goes on to tell how the pigeons swept along, up and down, like the waves of the ocean, wheeling and twisting like the "coils of a gigantic serpent."

Back in those days, folks thought the pigeon would never be exterminated. Even as recently as 1879, a pigeon butcher in Chicago said, "The pigeon is migratory, it can care for itself...(The pigeon) never will be exterminated so long asforests large enough for their nestings and mast enough for their food remains."

But the passenger pigeon---the bird that at one time "shadowed the fields like a cloud," and "darkened the sun" by its tremendous numbers---is gone. The last pigeon died in the Cincinnati Zoo in 1914.

What became of the famous passenger pigeons of a half century ago?

Some folks say the pigeons may have flown out over the ocean in huge flocks and got caught in a terrific storm. After battling the wind for hours, so these folks imagine, the birds fell exhausted and perished in the waves. Other folks explain the disappearance of the wild pigeons by theories wilder than the pigeons.

The best authorities hold different ideas. One man who spent a great deal of time studying the bird says the passenger pigeons were not exterminated at any single swift stroke. This authority says the pigeon gradually decreased over a period of more than 20 years. He tells how the pigeon butchers caught the pigeons by the millions and millions and shipped them in carload lots to the city markets,

and then says, "And when you are asked what has become of the wild pigeons, figure up the shipping bills, and they will show what has become of this, the grandest game bird that ever cleft the air of any continent."

The tales the old-timers tell of how the pigeon killers butchered the wild pigeons are both fascinating and terrible.

Audubon describes one of these butcheries at a pigeon roost on the Green River in Kentucky.

Audubon arrived at the pigeon roost just before sunset. He found a great many people at the roost with horses and wagons, and guns and ammunition, waiting for the pigeons to come back to the roost for the night. Some of the hunters had iron pots containing sulphur---some had torches of pine---many had poles---the rest had guns. Two farmers had driven upwards of 300 hogs to the roost to fatten on the slaughtered pigeons left on the ground.

When the pigeons came back to the roost, Audubon says they sounded like a "hard gale at sea passing through the rigging of a close-reefed vessel." They poured down into the roost out of the air like water over a gigantic waterfall. The pole-men knocked the pigeons down by the thousands. Other hunters lighted the fires. The guns spurted their deadly fire, but made no sound,---their roar was drowned out by the terrific din. The sight was wonderful as well as terrifying.

The slaughter went on all night. Along toward daybreak, the hunters began to pile the dead, dying, and mangled pigeons up in heaps until they had as many as they wanted. Then, the farmers turned in the hogs to finish the pigeons left on the ground.

Stories like the one Audubon tells of the Kentucky butchery are not at all unusual. You can find dozens and dozens of similar stories. The pigeon hunters caught thousands upon thousands of the pigeons in nets. They set fire to the trees to drive the young squabs out of the nests. They went to the roosts at night and chopped down big trees to crush the pigeons perched on the limbs. They put out poisoned bait. They sold live pigeons to sportsmen for trap-shooting. They shipped carload after carload to the city markets for food.

Even a bird such as the passenger pigeon---a bird that numbered in the billions---couldn't stand the strain of year-around slaughter, and the destruction of food supplies and breeding grounds.

H. P. Sheldon, Game Conservation Officer of the Bureau of Biological Survey, thinks the story of the passenger pigeon would have been repeated with other game birds if the State and Federal governments hadn't taken steps to protect them.

Starting along about 1870, when the passenger pigeon was passing out of existence, a number of states began to enact laws to protect waterfowl. However, Colonel Sheldon says the game commissioners and other men interested in protecting wild life realized the state laws were not adequate. Some of the states had no laws at all to protect birds. Other states protected only a few kinds of birds ---or only in certain localities---or for only a short season.

So, the sportsmen and conservationists got together and put through a Federal Migratory-Bird Law. This law passed in 1913 gave the U. S. Department of Agriculture power to fix closed seasons for migratory birds.

Colonel Sheldon tells us the effect of the Federal Act was immediate. Waterfowl and other migratory birds showed a marked increase. The birds went back to breeding places which they had abandoned because of excessive shooting.

But, of course, even a Federal law wasn't sufficient. Many of our migratory birds are no respecters of national boundaries. Some birds spend their summers in Canada and their winters in the United States. Others summer in the United States and winter in Mexico, or Central America, or even South America. They fly thousands of miles in getting from their summer homes to their winter homes. They make many stops along the way, Protection in the United States is of little value without protection in Canada.

So, in 1916, our government made a treaty with Great Britain to protect birds that fly back and forth between the United States and Canada. Both Canada and the United States agreed to pass laws to protect some 500 different kinds of migratory birds.

The regulations set up by our government under this treaty make it unlawful to kill migratory birds with guns bigger than No. 10-gauge. They also prohibit hunting or killing birds from airplanes, power boats, or sailboats. They also prevent the sale of migratory birds.

In the past two or three years the Federal government has taken still a further step to protect migratory birds. It has enacted legislation giving authority to set up a number of migratory bird sanctuaries.

Many naturalists think the passenger pigeon died off partly because we destroyed its breeding places and food supply. It is plain that the same reasoning applies in the case of some other species.

So, the Federal government is now engaged in setting aside refuges as feeding, breeding, and resting grounds for migratory birds. Vast regions where waterfowl were once abundant are now useless because of drainage developments and evaporation. But many of them can be restored to their natural condition, and while the work must proceed very slowly, there is hope that enough marsh areas may be saved in time to enable the wildfowl to escape the tragic fate that befell the pigeon.

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ANNOUNCEMENT: You have just heard a talk from Uncle Sam's Naturalists in the United States Department of Agriculture on how the Federal Government is protecting bird life. We will have another talk from the Naturalists at this time two weeks from today.

UNITED STATES DEPARTMENT OF AGRICULTURE — Radio Service — OFFICE OF INFORMATION

WITH UNCLE SAM'S NATURALISTS — October 21, 1932

FOR BROADCAST USE ONLY

Speaking Time: 10 Minutes.

ANNOUNCEMENT: And now for our talk with Uncle Sam's Naturalists. The United States Biological Survey has been busy for some years now trying to provide stop-over privileges for migratory birds, especially ducks and geese. Today we are going to hear a little about that work to save our wildfowl.

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Mr. Arthur A. Riemer, land valuation engineer of the United States Biological Survey, tells us about our national chains of landing fields for ducks and geese.

We call them our ducks and geese; but many of them, were hatched in Canada. Many of "our ducks" have their homes far up in the Arctic Circle. Many that our duck hunters miss this fall will go back to their northern nesting grounds to raise new families next spring. Wild ducks are true migrants. International and State boundary lines mean very little in their young lives.

Some nest along the northern edges of Canada and Alaska. The nesting sites of others are scattered through the vast stretches of western Canada. And, of course, we also have some very extensive areas in this country where ducks and geese nest as well as rest and feed.

You probably heard a few weeks ago that the famous Bear River Marshes of the north shore of Great Salt Lake, Utah, had been formally taken over as a Federal bird refuge.

Those Bear River Marshes are one of our big concentration points for ducks. That is a nesting site for many ducks, but with the change of the seasons ducks hatched in that area hop off for other States and other countries. Ducks banded by workers of the Biological Survey on those marshes have been recovered in 14 different States in our Great Basin and Rocky Mountain and Pacific Coast country and in Canada and Mexico.

In moving back and forth between their breeding and winter feeding grounds, ducks and geese follow definite travel routes. In most cases probably the same travel routes that were followed by their ancestors long before duck shooters ever came on this continent.

Year after year the ducks move down in the fall from their summer homes to their favorite winter feeding grounds. But year after year, men have been changing the conditions along some of the chief migration routes of our waterfowl.

Ducks don't just hop off from their nesting grounds and make a non-stop flight to their winter feeding grounds. Bird migration is usually a much more leisurely affair. The birds need landing fields and refueling stations, where they can stop and rest and feed on their long treks.

Ducks migrate along routes well sprinkled with plenty of marshes or other shallow bodies of water. A waterfowl without water is almost as bad off as a land bird without land.

As the country has developed, of course, the natural ranges of many kinds of wild life have been restricted. Waterfowl following the age-old migration routes have found their nesting and feeding and resting places shrinking.

In many cases we have been over-zealous in taking over duck lands for other uses. For instance, Mr. Riemer says draining duck marshes to use the land for farming is one of the big causes of the decrease in the number of ducks. Many of those projects have failed to pay for the expense of drainage. Because of poor drainage or other difficulties, the farm crops raised on many former marshes have proved less valuable than the duck crops. He mentions one very costly attempt to drain a duck lake, which has failed and part of which has now reverted to use as a hunting area.

And, of course, not all bodies of water are ideal for ducks. Ducks need water, and the water must be of the proper depth to grow the plants they eat. Shallow ponds and lakes and marshes must supply the waterfowl with food as well as lodging. Sudden and great changes in the level of a lake tend to kill out the forms of life upon which the ducks feed.

Many years ago our biologists and sportsmen and game lovers realized that our duck resources needed protection, and began to urge the establishment of Federal refuges where the waterfowl could find suitable conditions and safety from extermination. A few large waterfowl areas were set aside in some of our western States, generally on lands already controlled by the government, and some of the others had long been important waterfowl concentration areas.

In the eastern States, however, until less than four years ago, there were very few waterfowl refuges. In 1929, Congress passed the migratory-bird conservation act, to provide for the acquisition of land for Federal bird refuges. Under that act, the United States Biological Survey began to examine and map large areas to determine their suitability as duck refuges. Biologists have examined some 140 areas, and have located suitable sites in practically every State in the Union. As a result of these investigations 16 refuges are in process of establishment in 14 States.

The areas being considered form the main chains of the waterfowl landing fields. Mr. Riemer tells me that areas as large as 10,000 to 20,000 acres are considered more economical from an administrative standpoint by the Federal Government. Some are much larger than that.

The Great Malheur Lake Bird Refuge, in Oregon, for instance, covers about 90,000 acres and comprises a chain of three lakes. The largest Malheur is a big shallow lake, in most places not more than one to three feet deep.

Such great refuges will do much toward preserving our wild ducks and geese. Some of you may remember back to the days when ducks by the millions were slaughtered by the market hunters to supply hotels and restaurants with duck meat. Then you saw the number of ducks further decreased as a result of drainage operations. Then just about the time that our bird conservation act went into effect, many parts of the country began to suffer from a drought that continued for three years.

Yes, sir, it was so dry during those three years that many duck ponds and lakes shrank alarmingly. Duck feeds in many sections were killed off. Mr. Riemer says that some shallow lakes including Lake Malheur, which is several miles across, have at times been completely dried up.

To meet the emergency situation that faced the ducks, the Biological Survey proposed a plan for small privately owned waterfowl refuges to supplement the big Federal and State refuges. Wild-life organizations, sportsmen's clubs, Boy Scouts, farmers organizations, and individual landowners have taken up the idea in many parts of the country. By reflooding old pond sites and marshes, or building simple low dams across small streams or branches individual farmers and sportsmen may create ponds or small lakes up to three feet in depth, with marsh borders, which will greatly increase feeding, breeding and resting areas for the birds.

In addition, some of the refuge builders have seeded the margins of the ponds with food and cover plants for the ducks.

In many cases, however, the job is one of simply protecting some local waterfowl area from trespassers, involving no other expense or activity.

On all such areas it is important that the water level should stay about the same all the year round, so as to preserve the vegetation needed to make the place attractive to hungry, tired ducks and geese and to other forms of wild life.

Some of these water areas will be quite small, but Mr. Riemer says that ducks and geese make themselves at home even on potholes and ponds. The Biological Survey states that in the aggregate these small auxiliary areas are of great importance in supplementing our bigger waterfowl refuges.

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ANNOUNCEMENT: Uncle Sam's Naturalists will be back with us two weeks from today. This feature is prepared for Station _____ by the United States Department of Agriculture.

UNITED STATES DEPARTMENT OF AGRICULTURE

Radio Service

OFFICE OF INFORMATION

WITH UNCLE SAM'S NATURALISTS. RELEASE, Friday, November 4, 1932

FOR BROADCAST USE ONLY

Reading Time: 10 Minutes.

ANNOUNCEMENT: And now we'll take our bi-weekly jaunt into the great open spaces with Uncle Sam's Naturalists in the Bureau of Biological Survey. Today, we'll pick our way through the reeds and grasses down in the marsh to get acquainted with that interesting game bird---the coot, or "mud hen."

-ooOoo-

Listen! Hear that quacking?

Sounds like some ducks and coots on down this little stream.

I expect we'll find them swimming around in that little bay where this stream flows into the creek.

Let's move down in that direction.

We can follow this little path along the bank and come in behind that shack standing on the point running out into the bay. We can watch the coots and ducks from the porch of the shack.

Careful, there! This path is mighty slipoery.

We're getting closer. You can hear the quacking much louder now.

Listen! Hear that kind of high-pitched note---and then several deeper notes right along close together?

That's a coot.

---And hear that quack? Sounds something like a duck. But it isn't.

That's a coot, too.

Funny birds---those coots. You can hear them in the swamps and marshes night and day. Sometimes, they quack about like a duck. Then, they make this sound and that sound---always a racket of some kind.

Notice how the stream is widening out? We're getting down almost to the bay.

Listen! ---Right over there beyond that fringe of bushes along the bank of the stream! Hear those birds thrashing around in the water? And those coughing sounds? And those frog-like plunks? And that kind of sawing or filing noise? Sounds like a flock of coots down there. If we move over toward the bank maybe we can see them.

Sure enough! Look right through that break in the bushes. There you

see coots swimming by the dozens right in among the ducks.

Notice the head and neck of one of those coots. The head and neck are a kind of blackish color. The rest of the body has a bluish-slate tint.

---And look at the bill. The coot's big, ivory-white bill makes it easy for you to tell a coot from a duck.

Move over here a little closer to the edge of the stream.

See those three coots down over the bank there getting their breakfast? Watch how they walk. They bob their heads and hunch their backs like a guinea fowl. ---They pick at the seeds and grass just like a chicken.

Then, take a look at those coots out on the water.

Watch that one dive down below the surface. He's probably going under after a fish or tadpole.

Sh-h-h-h Don't move. They see us.

But they don't seem much afraid. As a usual thing, coots are pretty tame if you don't disturb them too much.

Let's move on down the stream. I think that old shack is just around the next turn in the path.

Yes, there's the shack.

We can cut right across this cleared space and get up on the front porch.

Here we are! This porch gives you a fine view of the whole bay.

Look at all those ducks and coots, would you! The water is fairly alive with them.

There goes a gun! Must be hunters in a blind across the creek.

Some of the ducks are taking to the air.

The coots are getting ready to take off, too.

Just look at those coots! There they go---running along on top of the water---beating the water with their wings and feet. They're making the spray fly like an old side-wheeler on the Mississippi. They're trying to get up enough speed to rise off the water. What a commotion! No wonder folks call those birds "spatterers."

Now they are rising off the water little by little like a heavily-loaded airplane. But they won't go high. A coot usually flies along 10 or 15 feet above the water.

They won't fly <u>far</u>, either. Coots never fly long distances except when they migrate. When they are trying to get away from an enemy, they usually swim or scurry along on top of the water.

Look at those coots flying along the bank right in front of us.

See how the coot stretches his feet out behind him with his toes turned upward? He uses his feet as a rudder in place of that useless little tail.

---And notice how that pointed, ivory-white bill gleams in the sunlight against that black head? ---And see the white tips on some of those feathers. You can tell a coot from a duck every time by the feathers and bill.

There goes another shot---and another---and another!

Look at those three birds falling to the ground! I guess they are all ducks. None are coots.

Most hunters don't shoot coots. They look upon a coot about like a 'possum hunter looks upon a skunk. If they take home a coot, they're afraid they'll get the horse laugh.

That's unfortunate, too. For in many places the coot is more plentiful than the duck. Dr. W. B. Bell, in the Bureau of Biological Survey, tells me waterfowl of all kinds have been having a rather tough time during the last year or so. Farming and other industries have been draining out some of the waterfowl concentration areas. And the drought dried up some of the breeding grounds. In order to save our waterfowl, Uncle Sam cut the open season last year from three and a half months to one month and this year made it two months. But, through all of the drought and draining work, the coot has fared better than the duck. The prejudice against the coot has spared it from the hunter's gun.

I asked Dr. Bell how he explained the prejudice against the coot.

Dr. Bell says folks used to think a coot wasn't fit to eat. They thought the meat had a strong, unpleasant flavor. But, if you know how to fix it, coot makes a mighty fine dish.

A couple of years ago, a group of prominent sportsmen and conservationists attended a dinner in one of the larger cities in Oklahoma. They ate what they thought was duck. The meat was good. They asked for second helpings. After the plates had been cleared away, those men got a big surprise. The meat wasn't duck meat at all. They had been eating coot, or as some people say, mud hen.

I won't try to give you full details on how to prepare coot. For the most part, you cook a coot just like you do a chicken or a duck. But, here's a little secret---and an important one. The strong, unpleasant flavor of coot that you hear so much about is only skin-deep. If you pull off the skin---and soak the meat in salt water or soda water for a few hours before you cook it ---you will have a fine dish. You won't be able to tell it from duck any more than the men could at the Oklahoma dinner.

So, the next time you go gunning for waterfowl, get acquainted with the coots. Include a few of them in your game bag. You'll have just as much sport shooting a coot as you would a duck. By shooting coots instead of ducks, you will give the ducks a chance to recover from the drought and over-

shooting during the past two or three years.

Biological Survey game officials tell me the season on coots is the same as on ducks and other waterfowl. In some parts of the country, the season has been open since Oct. first. In other sections, it will open some time this month.

The bag limit is 25 coots a day, and the open season runs for two months.

And remember: Skin the coot and soak the meat for several hours in salt water or soda water before you cook it.

-ooOoo-

ANNOUNCEMENT: And that was our regular bi-weekly visit with Uncle Sam's Naturalists. We hear these stories about our wild life through the cooperation of the Bureau of Biological Survey in the U. S. Department of Agriculture. We will have another visit with the naturalists two weeks from today.

UNITED STATES DEPARTMENT OF AGRICULTURE

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U.S. DEPARTMENT OF AGRICULTURE

WITH UNCLE SAM'S NATURALISTS RELEASE, December 2, 1932

FOR BROADCAST USE ONLY

Reading Time: 10 Minutes

ANNOUNCEMENT: And now it's time for Uncle Sam's Naturalists to bring you their story of the birds, and beasts, and great out-of-doors. Today, the naturalists vary their program a little. They will give us a few of the high lights from the annual report of the United States Bureau of Biological Survey.

---oooOooo---

As I talked with Uncle Sam's Naturalists about their work of the past year, I find they have been making an intensive drive against the underworld.

Yes sir, these Government men of the Biological Survey have raided some more of the hang outs of that notorious gang of underworld characters--the rodents. They have descended upon the dives and dens of the brown rats, and cotton rats, and field mice, and in localities where these and other pests were over-abundant they have wiped them out by the thousands and thousands.

The rodent-control men during the year carried on more than 250 anti-rat campaigns against the common brown rat alone.

One of the big campaigns in the war against the brown rat was carried on in the oil fields of East Texas. Members of the Texas National Guard stationed in the East Texas oil fields began to fall victim, one by one, to that dreaded disease, typhus fever. There were 61 cases of typhus fever in this section at one time. When State and county health officers began to look for the cause of the epidemic, they found the oil field a regular paradise for rats. Thousands of these gangsters were hiding out in garbage dumps, and lumber piles, and in the walls of poorly constructed houses and buildings. The health officers suspected the rats might be carrying the deadly typhus germs. They knew rats have a long-standing reputation as disease carriers, dating back to the terrible plagues of the Middle Ages. So, the health officials called on Uncle Sam's rodent-control specialists to help organize an anti-rat campaign.

The rodent-control men proceeded to make that East Texas oil field a most unhealthy place for rats. To begin with, they cleaned up garbage dumps, rat-proofed old buildings, and set out rat poison. They also spread soil over new garbage deposits to cut the rats off from food and shelter.

That anti-rat campaign checked the typhus-fever epidemic. In fact, Brigadier General Jacob F. Wolters, of the Texas National Guard later wrote to the Biological Survey and said:-

"New cases (of typhus fever) gradually fell off and stopped altogether. You not only killed the rodents, but you taught town and country folks alike the

importance of getting rid of them."

The Biological Survey also fought rats in the early-vegetable sections of the Florida Everglades.

In the Everglades that cousin of the common brown rat, the cotton rat was playing havoc with tomatoes and sweetpotatoes and other early truck crops. The cotton rat damage in just one county amounted to something over $150,000. in a single year. The vegetable growers warred against the rats without success. They called upon the rodent specialists for help.

The rodent control men in cooperation with the Florida game authorities first tried out different kinds of poison bait. Farmers had been using poisoned grain. But the rats didn't seem to like the grain baits and the grain baits also killed birds as well as rats. To prevent that trouble the rodent men decided upon a sweetpotato bait. Rats like the sweetpotatoes but the birds don't.

The vegetable growers spread the sweet potato bait in their truck patches. Members of the Future Farmers organization and the 4-H Clubs scattered the bait along the roadsides. The cotton rats ate the bait-- then they died off by the thousands. One man after using 27 cents' worth of bait, counted 260 dead cotton rats on a single acre.

That poisoning campaign in the Everglades cut the cotton-rat damage to a tenth of what it had been.

In New England, the Survey's rodent experts led fruit growers in an equally successful camapign against field mice.

Field mice chew off the roots of young trees and girdle the roots and trunks of older trees, so often that many growers take the damage for granted.

However, during the past year, the fruit growers put out something over 10,000 pounds of bait. That bait did its work. Nearly four-fifths of the growers reported that mice didn't bother a single tree after that poisoning campaign. Of the nearly 90,000 trees protected with bait, only 92---only about one tree in a thousand---showed any sign of mouse damage.

But, Texas, Florida, and New England farmers aren't the only farmers who have troubles with rodents. Western farmers also have special rodent problems. Besides rats and mice, western farmers have to contend with pocket gophers, ground squirrels, and prairie dogs. Pocket gophers, ground squirrels, and prairie dogs burrow through irrigation channels and water reservoirs, and riddle pastures and range land with holes, and ruin alfalfa fields. In the West, just as in the East, the rodent specialists of the Biological Survey are helping farmers stage poisoning campaigns.

But, pocket gophers, ground squirrels, and prairie dogs aren't the Western farmer's only worries; not by a long shot. In some sections, livestock growers and crop farmers have to fight mountain lions and wild-cats, to say nothing of wolves, and coyotes, and other predatory animals. During the past year, beasts of prey have been even worse than usual in some places, because fur prices have been so low that hunters didn't trap so much as formerly. So whenever the big cats,

and wolves, and coyotes, and other destructive animals get bad on public lands, Uncle Sam's hunters have to take a hand to protect the livestock grazing there and on the neighboring ranches. Last year, in cooperation with stockmen those men trapped and otherwise destroyed more than 17,000 animals in Texas alone.

Trapping work, by the way, brings up a problem. A trapper sets a trap to catch a lion, or a bobcat, or a wolf. However, when he goes to his trap the next day instead of a lion or bobcat he may find a harmless bird or skunk in the trap, if he has not gone about it in the right way. That not only means the loss of a harmless beneficial bird or animal, but also a waste of the trapper's time. To avoid such waste A.M. Day, of the Biological Survey, devised a little spring to attach to the traps. The spring fits right under the trigger. With that spring on the trap a bird or small animal can walk on the trigger in safety. But when a big animal like a lion or bobcat steps on the trigger, the trap springs.

This work of controlling destructive animals in cooperation with local landowners is only a small part of the Biological Survey's activities. A still bigger part of the job is to study and apply methods for protecting our harmless and beneficial wild life.

For instance, the naturalists are studying a disease that has killed millions of waterfowl and shore birds in the Western States in the past 20 years. The naturalists now know the cause of the disease. They also have found a means for remedying the conditions producing the disease.--The remedy is to control the depth of water on mud flats. Where you can't control these water levels, the remedy is to scare the birds away.

Another phase of the work is to provide refuges where our ducks, and geese, and other migratory birds can rest, feed, and breed without being routed out by the work of a steam shovel or a dredging machine. The Biological Survey was instrumental in setting aside 7 new Federal migratory bird refuges, during the past year, and enlarging 5 others. That brings the total number of wild-life refuges under the jurisdiction of the Biological Survey to 100, and many of them are enjoyed by ducks, geese, and other game birds.

The birds can live in these refuges undisturbed as long as other public agencies take the same attitude as has the State of Nebraska. A certain concern asked the Nebraska department of public works for permission to carry out a piece of drainage work that would have had a bad effect on the Federal migratory-bird refuge at Crescent Lake. But the Nebraska authorities turned down the request. They said it would be "detrimental to the public welfare."

As a further step to protect our bird life, the Biological Survey collects the facts about the habits and abundance of waterfowl and the need for shortening or lengthening the hunting season. This year the hunting season was kept shorter than in former years because of the serious affect on the birds brought about by the excessive shooting, drainage operations, and droughts of the past few seasons.

ANNOUNCEMENT: And that concludes today's visit with Uncle Sam's Naturalists in which you have heard some of the high lights from the annual report of the United States Biological Survey. You will hear another story from the Naturalists over (Station) _____ at this same time two weeks from today.

UNITED STATES DEPARTMENT OF AGRICULTURE — Radio Service — OFFICE OF INFORMATION

WITH UNCLE SAM'S NATURALISTS Friday, December 16, 1932.

NOT FOR PUBLICATION

SPEAKING TIME: 10 Minutes.

ANNOUNCEMENT: This is the day and hour for our regular Friday visit with Uncle Sam's Naturalists. Our Wilds Man has been talking with men in the Forest Service, United States Department of Agriculture, trying to get the facts on the future of the United States' wood supply. Where do we stand in reference to our stand of timber?

--o--

I can remember the time when one of the great concerns of the farmer was to get the timber OFF his land. That, in the country where I lived, was a time of clearing the land. And clearing the land was no small job. But a big change has come in the timber supplies of this country and now a whole lot of farmers would like to see more timber ON their land.

The same change has come about in the hills and in the forests. America's great stands of virgin timber--once thought INEXHAUSTIBLE--have been used up so fast that already the last extensive stands are being tapped. The United States is a great wood-using nation. Our newspapers alone eat up thousands of acres of timber every year. That morning or evening paper you buy for a few cents is printed on a wood-pulp paper and you have to have trees if you're going to have wood pulp. That's only one example of the country's mammoth appetite for wood and that wood has to be supplied somehow--unless we can find a good substitute. The trouble is, virgin timber is practically irreplaceable because of the length of time necessary to grow material of the highest quality. You can't grow a tree over the week-end, you know.

I was talking this over with some of the men in the Forest Service of the Department of Agriculture the other day and they gave me some figures. The forest land of the United States, they said, amounts to about 730 thousand square miles altogether. About 150 thousand square miles is managed for permanent timber production under public ownership, Federal, State, and local. The other 580 thousand square miles--an area larger than France, Belgium, the Netherlands, Denmark, Germany, and the British Isles, by the way--is privately owned. This privately owned forest land supports industries giving employment to more than a million people and turning out each year wood products valued at 2 billion dollars. This is enough to supply domestic needs and furnish wood products worth about 200 million dollars to foreign countries.

That sounds very impressive--that sounds like very good business. That sounds like America's wood pile is a very big proposition---and it is. But the trouble is, only a small portion of this woods land is now being handled so as to produce timber continuously. The greater part of the land is gradually drifting into idleness, producing so little that it is a burden to its owners and to the communities within whose territory it lies. Some 125 thousand square miles have

already stopped being productive and a much larger area is only partly productive. The UNPRODUCTIVE land, the Federal foresters say, is being abandoned not because of any serious difficulty in keeping it PRODUCTIVE, nor because no way to keep it productive is known, but because its owners doubt whether timber-growing will pay. Up until very recent years, as the virgin timber in one region was cut, there was always another virgin supply just over the hill or in the nearby country. But that's not so any more.

Now let's take a look at another side of the question. Government experts say that more wood is used in the United States than in any other country. WE CONSUME AS MUCH TIMBER FROM TREES LARGE ENOUGH TO SAW OUT LUMBER AS ALL THE OTHER COUNTRIES COMBINED---or about 13 BILLION cubic feet in all. The United States leads the world in the manufacture of many products made wholly or partly of wood. With only 6 per cent of the world's population, this country has 35 per cent of the world's railway mileage and for the transportation industries alone--including automobiles and railroads--we use nearly as much saw timber per capita as is required for all purposes in Great Britain, Germany, or France. We use immense quantities of wood every year for making, shipping and storing crates boxes, and barrels. Great forests are used up every year to make pulp for our paper supply. The United States is known all over the world as the land of wooden houses. We are cutting from our forests about 200 cubic feet of wood every year for each man, woman, and child in the United States.

Of course, the United States isn't alone amoug the nations of the world when it comes to using wood. Some folks think that wood is more or less out of date and that it's rapidly being replaced by cheaper materials or better materials. That doesn't seem to be so. Newsprint and other woodpulp products--automobiles--phonographs--radio cabinets--and many other articles requiring large quantities of wood, have come into extensive use within a generation. It seems that no sooner do we find substitutes for wood that new uses for wood arise. Many foreign countries have learned the truth of that.

China is the classic example of a nation that has suffered from an exhausted wood-pile. Some 2,500 years ago, China was abundantly supplied with forests. The population increased rapidly and the people cut the timber as it was needed, wastefully and without thought for the future. At first, the Government seldom or never interfered. Land clearings---wasteful cutting--repeated forest fires, continuing throughout many centuries, gradually pushed the forests back until they are confined to the least accessible parts of the mountains today. To get timber down to the main consuming centers of the country takes from 6 months to 3 years. This has put timber into the luxury class in China and the general public can't afford it. In many districts, timber large enough to make boards is so scarce that practically none is used save for the manufacture of coffins.

Let's carry the story a step further. Since wood for building or for fuel can't be gotten, you'd naturally expect the Chinese to turn to substitutes, such as coal, brick, cement, and steel. The country has these and other mineral resources in plenty. But without timber, it's impossible to use the substitutes. The few coal mines that are developed depend largely on imported timber for props, lagging, and other needed construction material. The railroads that carry the coal run on wooden ties brought in from Manchuria, Japan, or North America. Small native iron foundries use charcoal brought for many long miles on boats and on

men's backs. Domestic iron and coal, therefore, are produced only in small quantities and are so costly that they can hardly compete in the seaport cities with the iron and steel brought from North America and from Europe.

Well, there's the lesson---there's the situation in a country that wasted its wood supplies. What's the moral, so far as the United States are concerned?

But with all this, we are still going to need plenty of wood in this country. Even if our PER CAPITA consumption should fall as low as present European standards, the increase in population which is likely to take place in the next 50 years will keep our timber requirements at a level little, if any, below our present timber needs. Furthermore, it often takes wood to make the very things which are designed to take the place of wood. The coal mines of the United States alone consume a billion board feet of lumber a year. And of course we are constantly increasing and broadening the uses for wood. As our cities grow, more and more wood will be needed to make the containers in which their food is shipped in from the producing sections.

All this brings us down to a rather obvious moral: GROW MORE WOOD OR ELSE USE LESS. We will always need our forests. We should, therefore, conserve and maintain them.

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ANNOUNCEMENT: If you want more facts and figures on the future of America's wood pile, write to the U. S. Forest Service, at Washington, D. C. The talk to which you have just listened has come to you through the cooperation of Station _____ and the U. S. Department of Agriculture.

UNITED STATES DEPARTMENT OF AGRICULTURE

Radio Service

OFFICE OF INFORMATION

WITH UNCLE SAM'S NATURALISTS Friday, December 30, 1932

FOR BROADCAST USE ONLY

Reading Time: 10 Minutes.

ANNOUNCEMENT: We now chat for a few minutes with Uncle Sam's Naturalists about the Great Out-of-Doors. Today, the Naturalists have a suggestion for farmers, and bird clubs, and school, and 4-H clubs on how they can help protect our useful birds.

--oOo--

I ran across two stories the other day that go to show what a wonderful help birds are to the farmer---and, in fact, to land owners in general.

A certain Iowa farmer had a fence row of heavily sodded bluegrass right next to his cornfield. That fence row produced swarms and swarms of grasshoppers. In one particular summer, the grasshoppers chewed up three rows of corn 40 rods long. The farmer didn't get a single bushel of corn from those three rows.

Well, at that particular time, that farmer didn't put much faith in what he'd heard about birds protecting crops by destroying insects. But he decided to make a little experiment.

The following winter he went to town and got some drygoods boxes. He and his boys made those boxes up into bird houses. They put up 21 bird houses---spaced about two rods apart---all down along the edge of the cornfield.

Well, the birds took the hint. The following spring, they moved into 13 of those 21 new houses. Wrens nested in 6 of the new houses---bluebirds in 4 houses---and purple martins in 3.

All summer long the birds feasted on grasshoppers.

That fall, the farmer harvested 23 bushels of corn from those three rows next to the fence where, the preceding year, he got no corn at all.

Needless to say, that man had no further doubts about the value of birds.

A second man---this man from Wisconsin---gives still further testimony of the value of birds to the farmer. He says:

"I commenced ... over half a century ago, and have fitted my place for a bird paradise, with plenty of trees and shrubbery and one acre of lawn. Commencing with a single pair of grackles about 20 years ago, I have now over 200....I counted 17 on the first furrow plowed this spring. White grubs are about played out, and I have not seen a cutworm in five years."

Well, in those two particular cases, the birds happened to be feeding on

grasshoppers, and on grubs and cutworms. But those three insects don't begin to cover the birds' entire bill of fare. Birds feed on just about every kind of harmful insect you can mention. And a great many different kinds of birds eat the same insects. Specialists, who have looked into the eating habits of birds, find 205 different kinds of birds eat wireworms and 95 different species eat grubs. I might give you a whole host of other examples---for instance, 175 kinds of birds feed on leafhoppers, and 110 feed on billbugs, and so on.

But don't think for a minute that birds simply taste a lot of different kinds of insects and then eat very few insects of any one kind.

If you have ever watched birds traveling back and forth all day long with food for their young, you can appreciate what great numbers of insects a bird can eat in a day's time. Take that busy little house wren, for instance. The house wren brings a load of food to its young about once every 2 minutes all day long. Of course, not many birds can equal the wren's record. Most birds probably feed only once every 5 to 8 minutes. But even once every 5 or 8 minutes counts up pretty big in 10 or 12 hours.

The bird men checked up on the work of the birds on a 200-acre farm in North Carolina. That farm was over-run with green bugs, or wheat aphids. But the bird men found 3,000 birds on that farm. They figured the birds were cleaning up the wheat aphids at the rate of a million a day.

If you had a hired man who killed a million harmful crop insects a day, you probably would think he did a pretty good day's work. You would at least think he was worth his board and keep. Well, the birds certainly deserve the same consideration.

But, maybe you wonder just why the birds need any particular attention? Why can't they look after themselves?

Well, as W. L. McAtee says,--and McAtee is a bird authority in the United States Biological Survey--The birds work along willingly and faithfully as long as you give them a decent place to live. But, every time you clear out a piece of woods, or drain a piece of wet ground, or cut down a hedge - row, you wipe out birds' homes, and shelters. Finally things get so civilized the birds just 'up and leave.'"

But some of you may ask. "Can we afford to leave a lot of hedgerows, and thickets around the farm, simply as shelter for the birds?"

At one time, we may have thought we couldn't. But, as we have moved on farther and farther with our plows and axes, we have pressed the birds harder and harder. And now we begin to realize the value of birds. We find it may pay us to give them a little attention, after all.

In a great many places, schools, local bird clubs, and Audubon societies, are cooperating with landowners to set up bird refuges on farms. The landowner agrees to furnish the land and act as a kind of warden, while the club or school agrees to post the places and put up bird houses, and feeding stations. If the landowner and club decide to make the farm a refuge for game birds, the club may stock the farm with birds. Of course, if folks go to a lot of trouble to set up a bird refuge, they want to protect it. So, the folks who set up the

refuges make use of the laws authorizing game wardens to proceed against tresspassers.

Several States are also establishing effective refuges for some of our common song birds. McAtee tells me he knows of such refuges in New Hampshire, Connecticut, Illinois, and Minnesota.

Then, of course, many individual farmers and landowners are setting aside bird reserves themselves---without any help from clubs, or schools.

McAtee told me just how a person can go about making his farm or home grounds into a refuge for birds.

If you are interested in establishing a bird refuge, or in encouraging birds to live on your place, I suggest that you get in touch with your county agricultural agent, or the state college of agriculture.

Here are a few of his pointers on refuges.

He points out that our present-day brushless wire fences don't offer any attraction to birds. He says you can let shrubby growth get started along the fencerows, or you can plant fruit-bearing and other shrubs in gullies, and on ditch banks, and in various odd corners.

And when you set out trees and shrubs, always take into account their food-producing qualities. Keep that in mind also when you are cleaning up thickets. I can't tell you what shrubs and trees to leave standing, and what kinds to plant. But I can mention a few like the elderberry, blackberry, mulberry, dogwood, and wild grape, and sumac to give you a suggestion. I also might mention the cherry, and holly, and blueberry, and pokeberry, and service berry.

And remember, provide the birds a place to live. As you cut out your trees and woodlands, you destroy many of the old nesting places. Follow the example of the Iowa farmer and fix up some bird boxes.

Then, of course, don't forget to provide the birds a place to drink and take a bath. If you don't have any streams and natural pools, provide water in some other way. -----

Those are just a few suggestions on how to protect and attract birds. As McAtee suggests, if you want further tips on how to make your place into a bird refuge, get in touch with your county agricultural agent or the state college of agriculture.

ANNOUNCEMENT: And that concludes today's visit with Uncle Sam's Naturalists. This talk came to you through the cooperation of the United States Biological Survey and Station_____.